THE

physical therapy

REVIEW

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Research Studies in Technics for Electrical Stimulation — IDDINGS, MORRISEY, RODRIQUEZ, and KENDELL

Ancient Precepts for the Modern Practitioner — AREY

Supportive Appliances for Ambulatory Rehabilitation of Hemiplegics — von WERSSOWETZ

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Table of Contents:

Research Studies in Technics for Electrical Stimulation—Dorothy M. Iddings, B.S., Ruth C. Morrisey, B.S., Arthur A. Rodriquez, M.D., and H. Worley Kendell, M.D. 5

Ancient Precepts for the Modern Practitioner—Leslie B. Arey, Ph.D. 10

Supportive Appliances for Ambulatory Rehabilitation of Hemiplegics—Odon F. von Werssowetz, M.D. 13

Dancing Class in a Crippled Children's Hospital—Rhoda Leah Cohen, B.S. 17

Editorials 18

Association Activities 20

Membership News 21

General News 22

Index to Current Literature 26

Abstracts 27

Book Reviews 31

List of Approved Schools 33

Meet Our New Contributors 34

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Volume 31 **January 1951** **Number 1**

Research Studies in Technics for Electrical Stimulation*

Dorothy M. Iddings, B.S., Ruth C. Morrisey, B.S., Arthur A. Rodriquez, M.D., and H. Worley Kendell, M.D.

Experimental evidence accumulated since 1939 proves that adequate electrical stimulation of denervated muscle arrests atrophy and retards morphological, electrophysiological, and chemical changes incidental to muscle weight loss. In order to achieve these results, investigators concur that certain conditions relating to time, type of current, and nature of the muscle contraction are of fundamental importance to the therapeutic program. These may be enumerated as follows:

1. Treatment must be started as early after onset of paralysis or paresis as possible. Gutmann and Guttmann have demonstrated that the earlier the treatment is begun the more beneficial the result.

2. Treatment must be given daily for two or three ten-minute sessions or until fatigue occurs. There is no contraindication for stimulating a fatigued muscle but stimulation is useless when tension is not obtained.

3. Proper current form must be used. Kosman, Osborne, and Ivy have shown that a pure sinusoidal current which could be varied at will from 2-6000 cycles per minute is most effective in producing vigorous muscle contraction and tension, using a current intensity within the tolerance range of the patient.

4. Vigorous muscle contraction must be obtained.

5. The muscle should be made to contract against resistance. Hines, Melville, and Wehrmacher, and Kosman, Osborne, and Ivy have shown that greatest retardation of atrophy is accomplished when the muscle is made to contract against resistance.

In 1940 research was undertaken at Northwestern University Medical School to ascertain the therapeutic value of electrical stimulation for denervated muscle. One phase of the problem was to ascertain whether the results of animal experimentation could be duplicated in man. Patients afflicted with poliomyelitis served as subjects. In 1948 Osborne, Kosman, Bouman, McElvenny, and Ivy reported the results obtained on twenty patients. At the same time the technic used in this project was described by Shaber, Gosnell, Osborne, and Bouman.

In January 1948 the Department of Physical Medicine and Rehabilitation at the University of Illinois undertook to continue the project begun at Northwestern. It soon became obvious that the

*Read at the annual conference of the American Physical Therapy Association at Cleveland, Ohio, June 20, 1950.

Department of Physical Medicine and Rehabilitation, University of Illinois Research and Educational Hospitals, Chicago, Ill.

patients varied from day to day in their ability to tolerate current intensity, despite the use of current of optimal frequency. Since the development of tension is so important in treatment, and since this is directly related to the intensity of current tolerated by the patient, it seemed of paramount importance to us to develop technics which would allow the patient to endure the greatest amounts of current.

The purpose of this paper is to present some of the studies made during this research. Four combinations of variants of treatment technics were studied. With the exception of one, the results of the technics studied were insignificant. In the beginning of the project we used various-sized electrodes made of felt (orthopedic), approximately ⅜ of an inch thick and attached to perforated electrode metal by silk thread.

Various types of connections to attach the lead wire to the electrode were tried; none proved very satisfactory. Some of the problems encountered with this type of electrode were:

1. Poor connection between electrode and lead wire fastener
2. Difficulty in applying firm and even pressure over the site of the connection
3. Long period of time required for thorough saturation of the electrode with electrolyte
4. Unsanitary conditions presented by the promiscuous use of the same electrode on all types of patients
5. Concentration of salts of electrolyte in electrode by constant use of the same electrode
6. Corrosion of electrode connections due to being wet for many hours

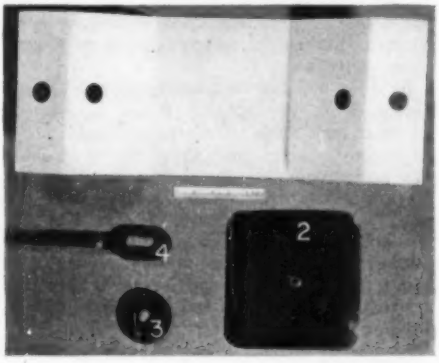

Figure 1. ELECTRODE COMPONENTS: *(1) absorbent paper, (2) chrome-plated, flexible electrode, (3) rubber insulator, (4) metal tip connector.*

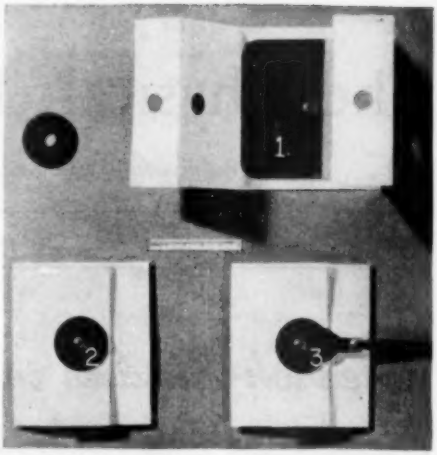

Figure 2. STEPS IN ELECTRODE ASSEMBLY: *(1) folded absorbent paper over electrode, (2) inserted rubber insulator snugly against paper, (3) attached lead wire connector.*

For two years a new type of electrode has been used which was described by Boerner in 1948. *(See Figures 1 and 2.)* This electrode consists of:

1. A metal insert of sheet brass 5/1000 of an inch (0.005″) thick, chrome-plated, with a raised button ¼ of an inch in diameter
2. A specially treated paper cover, perforated to allow the button of the metal insert to protrude—this paper absorbs moisture quickly but does not disintegrate when wet.
3. A perforated rubber disk, 3 cm. in diameter, which fits snugly below the button of the electrode —this serves as an insulator for the flat metal tip of the lead wire from the generator.

The advantages of this combined metal-paper electrode are:

1. The convenient method for connecting the electrode and the lead wire fastener
2. The flat fastener which permits a more even pressure and in turn a more even current dispersion to be applied over the entire electrode when fastened by an elastic bandage to the area being treated
3. The rapid saturation of the electrode with the aqueous electrolyte
4. Better antisepsis made possible
5. The elimination of the possible concentration of salts in the electrode by the frequent disposal of the paper coverings
6. The simplicity of application of electrodes

7. The conformation of electrode to the area treated

8. The comparative economy of electrodes

Three disadvantages of this electrode were detected during the course of these experiments. First, the paper cover would not retain as much of the aqueous electrolyte as a felt electrode. Patients were unable to tolerate the intensity of current (in milliamperes) with this electrode as with the felt electrode, resulting in a weaker muscle contraction. Minor skin burns were noted. To overcome these disadvantages a 6-ply gauze pad was cut to fit the face of the covering, with $\frac{1}{8}$ of an inch overlapping. *(See Figure 3.)* This gauze pad was placed over the electrode and the whole was thoroughly soaked in the electrolyte solution (hot sodium bicarbonate solution, 0.25 percent). The electrode was made highly absorbent by this addition and a smooth surface was maintained for good skin-electrode contact. The gauze pad was disposed of after each treatment.

The second disadvantage was corrosion of the metal inserts which became pitted and cracked, resulting in an uneven flow of current through the electrode. The "hot spots" were annoying and uncomfortable for the patient. This can be prevented in the majority of cases by proper care of the electrodes. Immediately after use they should be dismantled and the metal inserts carefully dried. The paper coverings may be used again if dried but should be discarded if any tears are noted. The metal inserts should be polished regularly.

The third disadvantage was that the flat fastener of the lead wire was too long for the small-sized electrode (3 x 3 inches square). This left a small area of uninsulated metal exposed. Obviously, if there were an absence of sensation below the electrode a burn might result. It was necessary to insulate this part of the fastener with tape.

It was observed during the studies that, occasionally, vigorous muscle contractions were not obtained despite the use of optimal frequency and careful application of the electrode. Several explanations are offered—an inherently low tolerance to current, and variabilities in the patient's epidermis at the time treatment was administered. This led to a further search for ways to make electrical stimulation more comfortable for the patient and thereby to produce a more vigorous muscle contraction. The importance of this in treatment of denervated muscle has been pointed out already and cannot be emphasized too much.

Kovacs states that heating with infra-red will result in sedation or relief of pain by the desensitization of superficial sensory nerves. This principle was applied to determine if the patient's tolerance to current might possibly be increased if the area to be stimulated received infra-red heat during stimulation as well as prior to stimulation. Two technics were compared. In both, a "baker" was the source of luminous infra-red heat. The first group of muscles received fifteen minutes prior to the electrical stimulation. The second group of muscles also received fifteen minutes prior to treatment, but, in addition, they received infra-red heat during the ten-minute stimulation period. The total milliamperage tolerated was recorded for each treatment. Two hundred and twenty-eight treatments were administered to seven muscles with infra-red heat, prior to electrical stimulation, and 232 to seven muscles before and during the electrical stimulation. It was found that the average milliamperage tolerated, when infra-red heat was applied prior to stimulation only, was 29.06, and the average tolerated when infra-red heat was applied both prior to stimulation and during stimulation was 30.85 milliamperage, a difference of 1.79 milliamperage. *(See Figure 4.)* The difference was not of statistical significance and substantiated what was observed clinically (by patient's reaction or observation of muscle contraction). In this group of studies there seemed to be no advantage to applying heat during the stimulation period.

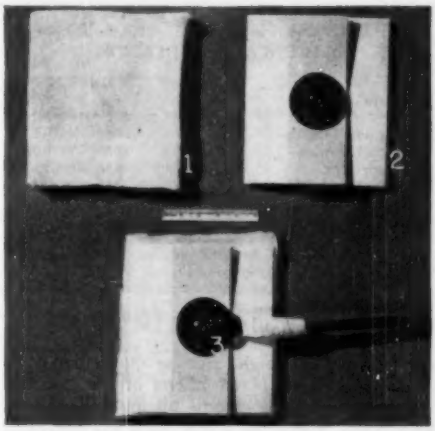

Figure 3. ELECTRODE COMPONENTS: *(1) six-ply gauze pad, (2) electrode covered with absorbent paper, (3) gauze pad in place, overlapping edges of paper-covered electrode attached to insulated lead wire connector.*

It is known that different metals have different resistivity to electrical current. It was postulated, therefore, that a metal with a lower resistivity to

RADIANT HEAT USED PRIOR TO ELECTRICAL STIMULATION				RADIANT HEAT PRIOR TO AND DURING ELECTRICAL STIMULATION			
Muscle	*No. of Rx.*	*Total ma.*	*Average ma.*	*Muscle*	*No. of Rx.*	*Total ma.*	*Average ma.*
R. Anterior Tibialis	54	1682	31.15	R. Anterior Tibialis	54	1769	32.76
R. Gastrocnemius	54	1660	30.74	R. Gastrocnemius	54	1725	31.94
L. Quadriceps	44	958	21.77	L. Quadriceps	48	1072	22.30
Intrinsic Hand Muscles	28	581	20.75	Intrinsic Hand Muscles	28	623	22.25
L. Quadriceps	16	570	35.62	R. Quadriceps	16	721	45.06
L. Anterior Tibialis	16	612	38.25	R. Gastrocnemius	16	594	37.12
L. Hamstring	16	572	35.75	R. Hamstring	16	651	40.68
Grand Total	228	6635	29.06	Grand Total	232	7155	30.85

Figure 4. Effects of Use of Radiant Heat on Current Toleration

electrical current might increase the patient's tolerance to current. Metal inserts of the electrode were cleaned of the chrome plating and replated with silver, which has a low resistivity compared with chromium. The resistivity of silver is 1.46 x 10^{-6} ohm/cm. and of chromium, 2.6 x 10^{-6} ohm/cm. Without the patient's knowledge, silver-plated electrodes were used alternately with chrome-plated electrodes on the same muscle. The maximum current tolerated was recorded during each treatment. Forty-nine treatments were administered to nine muscles.

Four of the nine muscles (quadriceps, anterior tibialis, quadriceps, and hamstrings) tested with the silver-plated electrode and five of the nine muscles (triceps, hamstrings, gastrocnemius, quadriceps, and anterior tibialis) tested with the chrome-plated electrode gave a higher average milliamperage tolerated by the patient. *(See Figure 5.)* The results of these studies were inconsistent and a wide variance in the standard deviation was noted. The statistical analyses conformed with clinical observations. From these studies there seems to be no essential difference between the two types of plating materials.

	Silver-plated		*Chrome-plated*	
Muscle	*Av. ma.*	*Standard Deviation*	*Av. ma.*	*Standard Deviation*
(P.M.)				
Triceps*	13.3	2.3	*14.6*	1.5
Quad.*	*36.5*	7.1	33.6	4.9
(R.R.)				
Ant. Tib.*	*22.4*	7.6	21.1	5.4
Hamstrings*	17.2	3.0	*21.5*	4.3
Quad.**	*19.8*	5.1	19.6	5.8
Gastroc.*	16.8	4.0	*16.9*	3.6
(J.N.)				
Quad.*	33.2	11.1	*45.5*	8.9
Hamstrings*	*31.1*	8.9	28.9	11.9
Ant. Tib.*	26.9	8.7	*29.8*	6.5

*20 treatments each
**15 and 14 treatments respectively

Figure 5. Comparison between Current Tolerated with Silver-plated Electrode and with Chrome-plated.

It has been a common practice in some places to use an electrode jelly as an electrolyte. A study was made with one* that is commonly used in obtaining electrocardiographs. Two technics on the same muscle were compared. The routine procedure, that is, soaking the adapted electrode in hot sodium bicarbonate solution, was employed every other day. On alternate days the same electrolyte, plus electrode jelly, was used. A total of forty treatments was given to five muscles. Twenty treatments were given with each technic on each muscle and the maximum current tolerated was recorded during each treatment. Three of the five muscles (gastrocnemius, hamstrings, and quadriceps) tested with electrode jelly, and two of the five muscles (anterior tibialis and hamstrings) tested without electrode jelly, gave a higher average milliamperage tolerated by the patient. *(See Figure 6.)* The results of these studies were inconsistent and a wide variance in standard deviation was noted. These analytical studies conformed to the clinical observations. There seems to be no justification for using this type of electrode jelly on electrodes for muscle stimulation during treatment.

It seemed logical that, if an electrolyte which had some local anesthetic qualities could be found, this factor might enhance the comfort of the patient during electrical stimulation. Benzocaine was added to the electrolytic solution. (A 5 percent benzocaine solution was suspended in calamine lotion.† As a control, plain calamine lotion as an electrolyte was used alternately on the same mus-

*Redux, Sanborn Company, Cambridge, Massachusetts.
†Selected only as a medium in which benzocaine could be suspended.

cle.) Studies were done on nine muscles. The maximum current tolerated was recorded during each treatment. In all nine muscles the benzocaine solution gave a tolerance of higher average milliamperage. This definite pattern seemed significant. In three of nine cases the "probability value" showed that the differences noted were not due to chance. *(See Figure 7.)* Clinically it appeared that there was definitely greater muscle contraction when the benzocaine solution was used and there was a significant difference in the milliamperage tolerated. Greater tension can be developed in the muscle, and the desired physiological effects of electrical stimulation can be obtained without untoward effects which might be attributed to the action of the drug. It appears from the results of these studies that the addition of 5 percent benzocaine to the electrolyte employed enhances the comfort during electrical stimulation, thus permitting a greater intensity of current.

SUMMARY

It is generally accepted that the development of tension in muscle is an important objective of treatment. It is also generally accepted that tension is directly related to the intensity of the current tolerated by the patient. Investigative studies in technics for electrical stimulation which might result in increasing the patient's tolerance to greater amounts of current have been presented. The following is a summation of these technics, grouped according to their significance:

Group A. *No Significant Difference in Average Milliamperage Tolerated*

1. Infra-red heat prior to electrical stimulation as compared with infra-red heat prior to and during electrical stimulation
2. Chrome-plated electrode insert as compared with silver-plated electrode insert
3. Electrode with jelly as compared with electrode without jelly

Group B. *Significant Difference in Average Milliamperage Tolerated*

Five percent benzocaine suspended in calamine lotion as compared with plain calamine lotion as an electrolyte (The 5 percent benzocaine used in the electrolyte allows greater amounts of current to be used.)

Muscle	*With Jelly* *Av. ma.*	*Standard Deviation*	*Without Jelly* *Av. ma.*	*Standard Deviation*
(R.R.)				
Gastroc.*	12.7	2.50	12.4	1.3
Ant. Tib.	11.9	2.06	13.3	3.3
Hamstrings	12.5	2.29	12.3	3.6
Quad.	11.9	2.46	10.9	1.9
(J.N.)				
Hamstrings	12.8	4.35	17.7	4.9

Figure 6. Comparison between Current Tolerated with Electrode Jelly and without Electrode Jelly.

Muscle	*Without Benzocaine* *Av. ma.*	*Standard Deviation*	*With Benzocaine* *Av. ma.*	*Standard Deviation*	*P. Value*
(R.R.)					
Quad.*	18.00	3.2	19.3	4.9	0.3
Gastroc.*	17.70	6.2	20.8	5.2	0.01+
Ant. Tib.*	22.18	5.1	24.5	4.5	0.2—
Hamstrings*	17.90	3.5	18.2	4.2	0.8—
(P.M.)					
Quad.**	33.70	4.9	47.7	4.7	0.001—
Triceps*	13.80	2.1	17.2	2.1	0.001—
(B.J.)					
Wrist flex.*	17.85	6.4	19.0	4.5	0.5
Biceps*	18.50	6.5	21.4	4.4	0.20—
Triceps*	18.00	3.2	19.5	4.7	0.2+

*20 treatments each
**14 and 13 treatments respectively

Figure 7. Comparison between Current Tolerated with and without 5 Percent Benzocaine.

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*Ancient Precepts for the Modern Practitioner**

Leslie B. Arey, Ph.D.

In addressing you today it is my intent to enumerate a few guiding principles, proved throughout the years in the practice of healing in all its branches. These principles may best be illustrated with reference to four important persons in the history of medicine. There is reason for this type of treatment because biography is our truest guide in such matters:

"At long intervals a bright, particular star appears on the intellectual horizon, endowed with genius of such a superlative order as seemingly to comprise within himself the whole domain of an entire science. These men do not belong to any particular epoch in the development of the human mind. Rather, they are the eternal symbols of progress and their history is the history of the science they profess."

All four of my examples, as you shall see, were men of this type; all were the first of their kind; all were in one way or another anatomists; and all were of the same epoch, that of the sixteenth century. Yet the principles they initiated remain as ideals for our conduct today.

A practitioner in the medical sciences must always be ready to challenge authority, and pursue independent thinking along whatever path the evidence may lead.

This precept I shall illustrate by the revolutionary accomplishments of Andreas Vesalius, anatomist and surgeon. The anatomist of antiquity who outshone all others was Galen; but after him fell the blight of the Middle Ages, and at the end of that long period of ignorance and inaction no advances had been made throughout some 1500 years. Destined to revolutionize this sad state of affairs was Andreas Vesalius, a Flemish subject. From childhood he tried to learn anatomy from scholastic writings, but found that even the great teachers at Paris held a blind reverence for authority and regarded Galen's writings as gospel. If the cadaver presented features unlike Galen's descriptions, the fault was not in the book but in the body. Or perhaps human structure had changed since Galen's time.

Chairman of the Department of Anatomy, Northwestern University, Chicago, Ill.

*An address given at the graduation of the twenty-ninth class of physical therapists at Northwestern University Medical School, September 29, 1950.

Traveling to Italy, Vesalius gained the chance to do as he wished at Padua. The clumsy barbers, who were the traditional prosectors, were brushed aside. He tried to follow Galen, but the body on the table frequently said something quite different from what Galen had written. In the end he cast Galen and his writings to the winds and taught only what he could see and show others. Out of this direct observation grew Vesalius' book, "De Humani Corporis Fabrica," adorned with marvelous plates, which laid the foundation for human structure as you have come to know it. Osler called it "the greatest medical book ever written." The "Fabrica" is more than a landmark in scientific progress; it created an epoch.

And so this powerful figure, by his own vigor and independence of observation, was able, before he was 30 years old, to overthrow not only the anatomical teachings of some 1500 years, but also to send crashing to the ground for all time the idol of authority in science. In its place was substituted independent, fearless observation of nature.

A practitioner in the medical sciences should not only be observant and fertile in ideas, but he must attempt to put these ideas to the test.

The next person to demand our consideration follows logically after Vesalius. The latter had revealed the structure of the human body in a new light and had freed mankind from the shackles of tradition. The next step was to introduce experimentation in order to determine the purpose of the structure so clearly revealed. This was done by William Harvey, an Englishman, who can safely be designated the father of physiology as we understand it today. Vesalius and Harvey, together, laid the foundation of the modern method of investigating nature.

The magnum opus of William Harvey was a small book, "De Motu Cordis et Sanguinis," of only seventy-eight pages. But it led to the reconstruction of our ideas on the circulation, and opened a new era of inductive, scientific thinking and experimentation. One of the finest mottos for the guidance and inspiration of scientific students everywhere should be a quotation from the preface of this remarkable work, wherein he says: "I profess both to learn and to teach, not from books, not from the positions of philosophers, but from the fabric of nature." This quotation you will find cut alongside the doorway of the medical building in which you have been pursuing your studies.

Prior to Harvey it was believed that there was an ebb and flow of the blood in both arteries and veins; that there were pores in the septum of the heart through which blood could pass; that there was, at best, a continuous passage of blood through the lungs, but not elsewhere. No one had grasped the concept of a complete circulation, with the blood moving in a circuit, propelled by the force of a beating heart.

The demonstration of this truth was the result of strict reasoning, based on experiments with ligatures, on an analysis of the movements of the living heart, and on the proper interpretation of the purpose of the valves within the veins. Like the "Fabrica" of Vesalius this book was a landmark in progress. The importance lay not so much in the mere demonstration that blood moves in a circuit, but rather, in that it gave the correct basis for understanding tissue nourishment, respiration, and excretion—in short, for the intimate analysis of all vital processes.

In addition, we must never forget that Harvey, above everything, showed the world a new way of discovering scientific truths. He first observed; then arranged his observations in a logical sequence; this led him to imagine a certain hypothesis; and with his hypothesis in mind he tested known, pertinent data to see if they tallied with the proposed explanation. As the argument grew stronger, he resorted to experiment and devised stringent tests by which the hypothesis would stand or fall. And thus the laws of nature, through the methods of Harvey, have come to be. This is why he is our ideal type of the questioning man who puts nature on the rack and demands an answer.

The practice of medicine, in each of its categories, is an art as well as a science. It is necessary not only to cure the disease but to cure the patient, whose comfort of mind and body is always paramount.

The first great exemplar of this humane principle was Ambroise Paré, a Frenchman, who through his experiences as an army surgeon became one of the great humanitarians of all ages. And it is he whom history will remember as the first to lay the foundations of the *art*, as opposed to the *science* of medicine; that is to say, he was the first to consider the patient as an entity worthy of study and consideration, whose *ease* is as urgent as his *dis*-ease.

One example will suffice to show Paré's fine appreciation of rational practice, and of the comfort and best interests of his patients. During a military siege he learned to stop blood-flow, following amputation, by using ligatures on the severed vessels. This was in opposition to the current cruel practice of applying hot irons in a cauteriz-

ing manner. Listen to his simple and modest report of this humane and sound advance:

"A culverin-shot hit a gentleman's leg and I had to finish cutting off of it, which I did without applying the hot irons. The camp being dispersed, I returned to Paris with my gentleman. I dressed him, and God healed him. I sent him to his house, merry, with a wooden leg, and he was content, saying he had got off cheap, not being miserably burned to stop the blood."

Ambroise Paré, medical humanitarian, will always be remembered as the first great exponent of the art of medicine.

The medical sciences constitute a broad field, but not so extensive as to preclude the need for other, liberal interests.

Lastly, may I emphasize the importance of cultivating and maintaining broad interests and enthusiasms outside the field of medicine. Here there is no hesitation as to our examplar. Although not a physician, Leonardo da Vinci qualifies with ease. He was the first great man of the new epoch, the Renaissance, and the most gifted man of history in both art and science. Truly he was a many-sided man with the broadest of intellectual horizons.

To know Leonardo only as a painter and sculptor is not to do him justice. Of direct importance to us was his work in anatomy, unknown to the world for three centuries. His drawings of dissections are so accurate and beautiful as to have led some to suspect, incorrectly, that they were copied by Vesalius. Although not the founder of modern anatomy, Leonardo was Vesalius' fore-runner—a St. John crying in the wilderness.

Of the other activities of Leonardo in which he gained distinction may be mentioned his works of engineering, studies on flying and aviation, experiments in physics, and observations on astronomy. His manuscripts on science alone treat of mathematics, mechanics, optics, astronomy, anatomy, geology, and botany.

Possibly he dissipated his genius somewhat through lack of concentration in any one field, and in this there may be a lesson of warning, but Leonardo was a rare genius and his passion was inclusive knowledge. This he justified by exclaiming: "He who knows all can do all." And we in moderation can well emulate this universally minded and universally beloved man.

* * *

And now my pedagogic habits do not permit me to make an end without having summarized what I have already said in detail. In order to practice your profession on its highest plane, the following precepts of conduct should become guiding principles:

You must be willing to challenge authority and pursue independent thinking, as was exemplified by Andreas Vesalius.

You should, where possible, test your ideas through the medium of experimentation, as did William Harvey.

You must cultivate the art of medicine, considering always, as did Ambroise Paré, the welfare of your patient.

To live a full life of the highest usefulness and to enjoy life's richest rewards you must seek culture in many fields, as did Leonardo da Vinci.

Translators Requested

A variety of professional magazines are received in the National Office from many foreign countries. A certain number of these are devoted to physical therapy, while many are medical journals containing some reference to the physical therapy field.

THE PHYSICAL THERAPY REVIEW is anxious to publish abstracts of such articles in order to keep the members of the American Physical Therapy Association fully informed regarding activities in the profession in all parts of the world.

Copies of these publications will be sent to any members willing to submit abstracts of articles containing information of interest to readers of the REVIEW.

We have already had a number of offers to translate French and German, but we are still anxious to hear from anyone who can read **Spanish.** If you would care to participate in this program, send your name, address, and language preference to the American Physical Therapy Association, 1790 Broadway, New York 19, New York.

Supportive Appliances for Ambulatory Rehabilitation of Hemiplegics

Odon F. von Werssowetz, M.D.

Weeks after the acute phase of hemiplegia, it is necessary to start walking training. This retraining may be interfered with by certain persistent functional impairments of the lower extremity. These impairments, due to residual motor difficulties, include drop-foot, with or without associated disabilities of fore-foot, instability of the knee and hip, and rotation and adduction or abduction disability of the thigh. If the proper care is started early, it will correct most of these weaknesses; however, some remain in spite of all treatment. In such cases, it is necessary to consider the use of supportive appliances if early effective ambulation is to be obtained.

It is the duty of the physician to select and prescribe the appropriate support. This responsibility can not be delegated to the brace-maker. The intelligent application of an efficiently designed and properly fitting mechanical device is just as essential as is the skillful execution of a surgical operation. It should be based on the evaluation of the disability which is obtained by repeated analysis of muscle function and by observations during all phases of preambulatory training. This evaluation should note the flexibility, extensibility, and muscle strength not only of the affected joints but of all joints of the involved extremity.

Disability in hemiplegia results primarily from muscle imbalance. Deformities occur following the assumption of faulty position during treatment, or from the effect of weight-bearing stresses on the unprotected extremity. The stability of the joints will determine the type of brace to be used and the extent to which mobility will be permitted in the artificial joints. If stability is lacking, then it is essential to incorporate it into the supportive apparatus.

Chief, Physical Medicine Rehabilitation Service, Thayer Veterans Administration Hospital, Nashville, Tennessee.

Published with permission of the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibility for the opinions expressed or the conclusions drawn by the author.

Before early ambulation can be attempted, it is necessary for the patient, who may be deprived of or has defective proprioceptive reflexes, to develop a new balance-awareness. This awareness is developed through training in voluntary changes of posture. The degree to which the balance-awareness is developed will be an important consideration in the selection of an appropriate apparatus. If the patient can not develop a balance-awareness, in the majority of cases braces will not be helpful in locomotion.

Basically, the function of a brace for a hemiplegic patient is not to support the body weight, but to maintain the body postural alignment as normally as possible through its splinting action. The effect should be to help the weakened muscle groups responsible for maintaining the stable position by external supports, but not to replace them completely. The brace should restore stability to the extremity but should preserve the maximal permissible joint function. It should re-establish weight-bearing ability and a normal line of gravity, and facilitate locomotion. It cannot substitute for loss of muscle tone or lack of co-ordination. It should prevent deformities, but it cannot be expected to correct them unless they are of a very mild type. Therefore, before the application of a brace, it is necessary to correct as far as possible all existing deformities.

After a thorough evaluation of the disability, a brace that most nearly replaces the existing deficit is selected. It should be fitted and aligned properly. The position of the joint is the most important factor in alignment of the apparatus. The artificial ankle joint should be placed just above the tip of the lateral malleolus, in line with the transverse axis of the talotibial joint. The brace joint at the knee should be located at the plumb line of gravity and the transverse axis of the knee, i.e., it should be placed opposite the midpoint of the medial and lateral condyle of the

femur. The hip joint should be located at the level of the tip of the greater trochanter and slightly anterior to it.

BRACING FOR THE FOOT

To permit a good weight-bearing and functional foot a brace should:

1. Allow the body weight to be distributed evenly over the plantar surface of the foot.
2. Give good lateral stability to the foot, despite the muscle imbalance present.
3. Retain the maximal permissible amount of "push off" during locomotion.
4. Permit the optimal range of motion in the ankle joint.

The disabilities found in the foot are either simple or complicated drop-foot. Complicated drop-foot occurs when the fore-foot shows medial or lateral deviations. Each condition presents specific bracing problems.

Simple drop-foot, with no deviation of the fore-foot:

A straight drop-foot is caused by weakness or paralysis of the tibialis anterior, the peroneus tertius, the extensor hallucis longus, and the extensor digitorum longus.

Mild drop-foot: When weakness of the dorsiflexors is very mild and the muscles show good coordinated function, a simple spring support may be used to correct the drop-foot. This "shoe horn" support consists of a flat spring attached to the heel of the shoe and a cuff counterpoint midway up the calf. This type of support is easily applied and is sufficient to correct mild disability.

A simple elastic support is used for mild weakness of dorsiflexors with coordinate muscle function. The use of such a support has been recommended when the weak dorsiflexor muscles are unable to contract effectively against the added weight of the footwear. Repeated attempts at locomotion would result in an overstretching of these muscles, with consequent increase in disability. This support is used when there is reason to believe that the involved muscles will increase their functional recovery. With this support, it is necessary to take precautions to prevent overbalancing of the drop-foot.

For mild drop-foot Buerki used a simple wire brace attached to the heel, having a counterpoint in a cuff pressure on the calf. This type of brace furnishes some lateral stability to the ankle. A simplified modification of this brace permits it to be transferred from one shoe to another.

Moderate simple drop-foot: If the condition appears to be of a permanent nature and the support is to be worn indefinitely, and if there is only a moderate amount of paralysis and lateral instability present, then a double-bar brace with spring joints at the ankle (such as the Klenzak-Pope type of brace) gives efficient results. The automatic adjustment of the toe lift permits easier locomotion, with an almost normal gait. It prevents stumbling or tripping. The degree of elevation of the toes is easily controlled by varying the tension of the springs in the artificial ankle joints.

Severe simple drop-foot: In an extensive involvement, there may be complete paralysis of all the muscles of the foot. This results in a totally flail foot, devoid of all active motion and support. For such a foot, the provision of stability at the ankle is paramount for locomotion. A stirrup-type brace should be used, having ankle springs or stops for limited joint motion and strong, double, upright bars, and should be equipped with two moderately-wide cuffs, one below the knee and the other about 2½ to 3 inches above the medial malleolus. The motion permitted should be about 5 to 10 degrees of plantar flexion and 10 to 15 degrees of dorsiflexion.

Drop-foot with deviation of fore-foot:

If the weakness of the muscles in the foot is unequal, then this unbalanced action will result in varus or valgus deviation of the drop-foot.

Drop-foot with varus position: This is the most common disability occurring in hemiplegic feet. It results from the pull of a stronger tibialis anterior or tibialis posterior, or both, opposed to weak or totally paralyzed peroneal muscles. The foot assumes a position of inversion and the patient, on attempted locomotion, puts the weight on the lateral border of the foot. Usually there is some decrease present in the lateral stability of the ankle.

Intelligent treatment of such a foot requires, in addition to the correction of the drop-foot, that the support provide correction of the varus deformity. Usually the brace should be of the double-bar stirrup type, with ankle stops for limited motion and with a T-strap for correction of the varus deformity. Because the weight bearing is on the lateral border of the foot, the T-strap is fixed on the lateral side, at the bottom of the shoe, and attached to the medial upright bar at the ankle joint. This will lift the lateral border of the foot and allow the body weight to be distributed over the entire plantar surface of the foot. It is important to remember that the T-strap should be

placed at the site of the lateral motion of the foot. This motion takes place at the talocalcaneal and midtarsal joints. Therefore, the T-strap should be placed well forward, in front of the upright bars and over the axes of these joints.

Single-bar braces are occasionally used, though these do not provide efficient stability. If the weakness is not too severe, a single, medial, upright bar brace can be used for cosmetic reasons to correct this disability of drop-foot with valgus deviation. The T-strap should be attached as stated above.

Drop-foot with valgus position: Unbalanced action of muscles caused by weakness or total paralysis of the tibialis anterior, and/or the tibialis posterior, muscles will permit excessive pull of the peroneus longus and peroneus brevis, and will result in valgus deformity.

The double, upright bar, stirrup-type brace should be used with a T-strap placed on the medial side of the shoe over the axes of the talocalcaneal and midtarsal joints. When a single bar brace is used, it should be placed on the lateral side of the extremity with a T-strap starting on the medial aspect of the shoe. This type of brace does not provide too much stability.

Bracing for the Knee

In a certain percentage of hemiplegic patients, a varying degree of residual weakness of the quadriceps femoris muscle may persist, in addition to the foot involvement. This deficiency may cause a certain amount of instability of the knee joint, and may be associated with a lack of complete extension. This will result in inability to maintain the body in an erect position on weight bearing and will interfere with locomotion. In such case, bracing of the knee is indicated. The type of brace to be used will depend largely on the remaining function of the quadriceps. If the weakness is of mild type, a long leg brace with a free knee joint to 180 degrees is all that is required. This brace will stabilize the knee sufficiently during the weight-bearing phase and will prevent hyperextension.

If there is marked instability, a long leg brace with double-lock knee joints is essential, as it must give firm lateral support. It must be accurately fitted with strong side joints to prevent lateral stresses. A single-lock knee brace is not recommended as it will not prevent rotation. A very satisfactory brace for such a condition is the Klenzak or Pope type of long leg brace, equipped with a spring at the ankle that overcomes the drop-foot and has automatic extension locks at the knee.

Bracing for the Hip Joint

There are very few persistent disabilities at the hip joint complicating hemiplegia. If they do occur, they do not follow any particular pattern. Internal rotation and adduction position appear to be more frequent in the spastic type of paralysis, while external rotation and flexion are more common with flaccid involvement.

The presence of disability about the hip, associated with muscle weakness and lack of stability of the hip, is manifested by the inability of the patient to maintain proper postural alignment during locomotion. To correct this muscular imbalance, a pelvic belt with an artificial hip joint is added to a long leg brace. Usually the hip hinge is free; only very rarely is a lock joint required. This joint will control the imbalance of the muscles satisfactorily and will permit motion for effective ambulation.

Training in the Use of the Supportive Apparatus

It is obvious that a patient who is to wear a supportive appliance for a considerable time will require training in its use. This has not been emphasized sufficiently. A brace which gives lateral stability to the limb imposes certain limitations in the rotary component during locomotion. This change causes altered motion of the individual bodily segments and disturbs the dynamic balance. Furthermore, there may be a change in inertia, speed, and acceleration caused by the added weight and mechanical limitations of the brace. To correct these factors, training is necessary for balance and muscular coordination if effective ambulation and use of the appliance is to be expected.

When the brace is applied, the patient should be warned that he must become accustomed to its use gradually. He should be told how to put it on and take it off. He should be instructed in as normal a gait as is possible, and in how to maintain proper postural alignment. The patient should learn how to get in and out of a chair, particularly if he is wearing a long leg brace. He should be retrained to perform all of the activities inherent in daily living, which he may be lacking. Of these, the more important are: ascending and descending stairs, walking up and down ramps, picking up objects from the floor, stepping onto and off a curb, and walking on rough ground. All of these require painstaking instruction and constant supervision.

SUMMARY

1. Persistent disability, weeks after the acute phase of hemiplegia, will require the use of supportive appliances if early effective ambulation is to be obtained.

2. It is the duty of the physician to select and prescribe the appropriate support. He cannot and must not delegate this responsibility to the bracemaker.

3. After a careful evaluation of the disability, it is essential that a proper supportive apparatus be selected. This evaluation includes the analysis of muscle function, stability of the joints, range of motion, and balance-awareness.

4. The supportive apparatus for hemiplegia should maintain normal postural alignment, reestablish weight-bearing ability, and facilitate locomotion. It cannot substitute for loss of muscle or bone, or lack of coordination. It cannot correct deformities.

5. The position of the artificial hinges of the brace is most important. The ankle hinge should be at the tip of the lateral malleolus, in line with the transverse axis of the talotibial joint. The knee hinge should be located at the plumb line of gravity and the transverse axis of the knee. The hip joint should be located at the level of the tip of the greater trochanter and slightly anterior to it.

6. Bracing for the various hemiplegic disabilities of the lower extremity is discussed. All major braces should be of the stirrup type. Caliper braces are not recommended as they do not permit physiological motion in the foot.

7. Training in the use of the supportive apparatus is emphasized as an important part of the rehabilitation of the patient. The patient should be instructed in performing all the activities in daily living, which may be lacking.

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Dancing Class in a Crippled Children's Hospital

Rhoda Leah Cohen, B.S.

Due to the persistent urging of crippled children and their parents to learn how to dance, The House of St. Giles The Cripple organized an experimental dancing class. Psychologically, a child should become an active performer in some field, and it was interesting to note that most crippled children want to dance. While hospitalized, the crippled child's playmates have disabilities of a similar nature, and competition in a hospital bed is greatly minimized. Therefore, it is not until the handicapped child is returned to his home environment that he realizes that he is "different," though his handicap be great or small.

We interpreted the handicapped child's desire to dance as a manifestation of his desire for self-expression and, therefore, started a series of ten dancing lessons. The classes were of one-hour duration, covering a period of two-and-one-half months. The children were divided into three class groups. The first group were polio children, aged 4-7, the second group, polio children, aged 8-14, while the third group were cerebral palsy children of the spastic and athetoid type, aged 4-6. The applicants for the dance class were carefully screened. Care was taken to choose children who could perform activities without substitution. The cerebral palsied children could all walk alone.

The dancing teacher worked closely with the physical therapist. It was necessary for the teacher to acquaint herself with the individual child and his disability, before the child was instructed. The program plans for the dance class were very flexible, to cope with conditions such as interest span, fatigue, and ability. Much of the dance work was descriptive, for example: "Let's pretend that we are the stars in the sky falling to the ground," or "we are the birds in the sky, how shall we fly?" The children elaborated upon these ideas, and to our surprise, entertaining interpretative dancing resulted. Nursery rhyme recordings and records like "The Nutcracker Suite" accompanied the dancing.

The children were eager to respond to the dance technics and the classes were thoroughly enjoyed by all. Indirectly, the dance class was used as a media to stress therapeutic exercises. The spastic children exercised the heel-to-gait, though they were made to feel that they were performing an Indian War Dance. It was noted that while performing mass movements, such as those performed in a creative dance, the children's disabilities were "masked" to a great extent. We noted that the children were relaxed, happy, and had more social poise. Therefore, we concluded that the dance class was a useful supplement to other methods used in the readjustment and rehabilitation of the crippled child.

Director of Physical Therapy, St. Giles Hospital, Brooklyn, New York.

Editorials

Again poliomyelitis has ravaged our country and the 1950 toll of victims was the second highest ever recorded. This came immediately following the epidemic of 1949 which was the most devastating in history. Unprecedented demands have been made upon limited resources of professional personnel, hospitals, clinics, and home care services. While funds were needed to care for 1949 polio patients, these same funds had to be stretched to provide for 1950 patients.

In every month of the year urgent requests came to the Polio Recruitment Service of the American Physical Therapy Association to recruit physical therapists to care for the increasing number of polio patients. One hundred and thirty physical therapists were placed in temporary emergency assignments in twenty-five states. Some requests remain unfilled at the beginning of the new year.

The National Foundation for Infantile Paralysis has maintained the leadership in providing funds for patient care, procuring equipment, training personnel, and supporting many research projects. These funds come from the "March of Dimes." The National Foundation for Infantile Paralysis supports the Polio Recruitment Service of the Association. In recent years, the National Foundation has awarded approximately fifteen hundred scholarships to provide basic professional education and advanced preparation for supervision or teaching.

Poliomyelitis is manifesting a tendency to become more widespread and is attacking more individuals in more areas. We must prepare to meet a possible emergency in 1951. Professional personnel must be assigned to cope with epidemics, while we try to fill normal needs, in addition to great defense demands. All of us must cooperate. Several of our chapters have taken the lead in organizing active and inactive members to provide part-time assistance in hospitals and clinics. Facilities within metropolitan areas have worked out cooperative plans to share personnel during epidemic periods.

You can help:

1. By participating in the local program to meet polio needs
2. By contributing to the "March of Dimes"

This is the best type of public relations for the profession of physical therapy. This is a way to show your appreciation to the National Foundation for Infantile Paralysis for what it has done for polio patients and physical therapy.

The Director Reports:

In the October issue, there was a notice about a second class for physical therapists, conducted by the Army Medical Service, to start in February. The course will now start in March and there are still vacancies. Let's fill this class! Have candidates write now to the Office of the Surgeon General of the Army or the Air Force, Washington 25, D. C.

The President of the Association and the Executive Director attended the Midcentury White House Conference on Children and Youth, December 3rd to 7th. The Association also had an exhibit. A report of the meeting and its implications for physical therapists will appear in an early issue of the REVIEW.

There is no news yet about the bill which would provide for commissions for men physical therapists. It is expected to be reintroduced after the first of the year when the new Congress convenes.

It is hoped that all chapters have contacted their local Civil Defense organizations. It is recognized that in some areas that organization is not complete, but nevertheless liaison should be made.

A recruitment poster for school bulletin boards will be available for distribution about February 1st. Packets will be sent to all chapters, and any individual member wishing a supply may obtain them from the National Office.

The brochure, "Our Association," is being revised and has a brand new cover. It, too, will be available by February 1st.

Miriam Rodenberger, Chairman of the Committee on Exhibits, is now on duty at Lackland Air Force Base, San Antonio, Texas. She is, however, continuing with her committee duties.

The year 1951 will be a busy one for all of us. Keep in touch with Association activities through your REVIEW. The demands on us will be great and we must not only be informed, but ready for whatever we must do.

—MILDRED ELSON

Reading from left to right: Hotel Colorado, at Glenwood Springs, Colorado; the world's largest outdoor swimming pool, containing natural warm mineral water, the temperature of which is always between 72 and 75 degrees; and the Glenwood Springs Clinic.

Your Convention Vacation

So you've decided to take a "convention vacation" in June 1951? That's just the way we figured you'd feel about it, so we chose the Hotel Colorado at Glenwood Springs, located just 160 miles west of Denver in the mile-high altitude. It has the world's largest, outdoor, warm-water swimming pool with a sandy beach, an all-grass golf course, tennis courts, and a stable of riding horses. The adjacent scenic beauty of Glenwood Canyon and the Rockies is a challenge to the more rugged individuals who like climbing and riding. We've also thought about the ardent anglers. The fishing in the nearby mountain lakes and streams can't be surpassed. And, for those who like the less strenuous forms of recreation there's a modern cocktail lounge, roomy sun porches, patio, dance music, and chuck wagon dinners.

Hotel Colorado was built in 1892 with English capital. It was formally opened in May 1893. The Hotel and Yampah Hot Springs Swimming Pool were built originally as a Spa for the very wealthy and, as such, became internationally famous. The Hotel has entertained many presidents of the United States. "Teddy" Roosevelt stayed there every year he was President, and one summer he moved the entire cabinet to Glenwood Springs.

During the early history of Hotel Colorado many of the guests arrived in Glenwood Springs in their own private railroad cars. The evening meal was always a formal dress affair. After dinner it was the custom to promenade across the bridge to the building on the edge of the Yampah Hot Springs Swimming Pool which was an elaborate gambling casino with inlaid mosaic floors and the most luxurious furnishings.

Long before the white man settled this area, Yampah Hot Springs was well known for its curative, healthful properties to the Indian tribes of the Rocky Mountain Empire. The tribe who held possession of the Springs possessed "The Big Medicine" of that time.

During World War II, Hotel Colorado was a naval convalescent hospital for three and a half years. The year-round healthful, invigorating climate, the relaxing effect of the mineral water pool and the cave baths, plus the beautiful scenic location, all contributed to the health of men of all naval branches of the service.

Today the Hotel Colorado is one of the finest hotels in the country. It is rapidly becoming a mecca for vacationists and convention groups who desire a restful, zestful time in the midst of "The Alps of America."

See us next month for inside information on the "vacation" part of this dual plan—exciting trips to Santa Fe, Taos, The Mesa Verde, and Aspen. Also be on the watch for wardrobe tips. In the meantime may we suggest some interesting reading on the Rocky Mountain area: "TIMBERLINE," Gene Fowler, "HIGH COUNTRY," C. R. Cooper, "GHOST TOWNS OF COLORADO," Writers Program.

ETHEL BRIESEMEISTER
Publicity Chairman, Colorado Chapter

Association Activities

World Confederation for Physical Therapy

The organizational meeting of the World Confederation for Physical Therapy will be held as previously announced in Copenhagen, September 7th and 8th, 1951. In addition, all physical therapists are invited to attend the Second International Polio Conference in Copenhagen, September 2nd to 7th, and the Fifth World Congress of the International Society for the Welfare of Cripples in Stockholm, September 10th to 14th.

Travel Plans. Through a cooperative arrangement with the National Foundation for Infantile Paralysis and the International Society for the Welfare of Cripples, all east-bound space on the Swedish-American liner, Stockholm, has been reserved for those attending these conferences. Any physical therapist on the North American continent planning to leave from New York may reserve space. The ship leaves August 25th and arrives in Copenhagen September 2nd. Arrangements for space should be made through Thomas Cook & Son, 587 Fifth Avenue, New York, N. Y., attention of Mr. C. L. Hill. This may be done through local travel agents. All return plans are up to the individual. If any American Physical Therapy Association members are planning to attend, make your travel plans now. It would be appreciated if you would notify the Executive Director of the Association of your plans in order that room reservation blanks for Copenhagen and Stockholm may be sent to you. These will be available in early February. Physical therapists anywhere in the world are cordially invited to attend. Further information may be obtained from Miss M. J. Neilson, Convener and Secretary, Provisional Committee, World Confederation for Physical Therapy, Tavistock House North, Tavistock Square, London W.C. 1, England.

New Vice-president

Major Harriet Lee of the Women's Medical Specialist Corps, U. S. Army, who has previously served so ably as Vice-president of the American Physical Therapy Association, has been appointed by the Executive Committee to fill the vacancy created when Mary Haskell resigned to accept appointment as Assistant Executive Director.

Chapter News

Eastern Michigan: A very successful joint meeting of the Eastern Michigan chapter and the Michigan Occupational Therapy Association was held at Children's Hospital in Detroit early in November. The theme of this meeting, which was planned for a Saturday afternoon and evening, was "Evaluation of Special Apparatus for Celebral Palsy." The program was planned to give all therapists an opportunity to ask questions, offer suggestions, or discuss cerebral palsy apparatus in general. The speakers presented the problems and asked for solutions from the audience. Discussion periods followed each subject. Eight agencies concerned with the treatment of cerebral palsy exhibited apparatus. Reports of the meeting were mimeographed for distribution to the Chapter members.

The afternoon session included an introduction by Ruth Anderson of the Detroit Orthopedic Clinic and three talks (coordinated by Anna Mulcahy, Detroit Orthopedic Schools) as follows: "Relaxation Aids" by Marcia Shaw, Sigma Gamma Hospital School; "Aids to Speech" by Mrs. Barbara Robb, Speech Correctionist; "Educational Toys" by Phyllis Carleton, Windsor Curative Workshop. Tea and inspection of the exhibits concluded the afternoon. In the evening, with Mrs. Frances Herrick of Michigan State Normal College as coordinator, the Group discussed "Balance and Walking Aids" with Emily Adams, Oakman School, and "Self Help Equipment" with Beatrice Ware, Rackham School of Special Education.

Membership News

Jessie Wright, M.D., Medical Director of the D. T. Watson School of Physical Therapy, University of Pittsburgh, has been named Occupational and Physical Therapist Consultant to the Surgeon General, United States Air Force. Dr. Wright is a graduate of the University of Pittsburgh School of Medicine and holds a Fellowship in the American Medical Association.

Second Lieutenant **Betty Gray Proctor,** formerly with the Veterans Administration, St. Louis, Missouri, has been appointed recently to Extended Active Duty at Westover Air Force Base, Chicopee Falls, Massachusetts.

Two newly appointed officers in the U. S. Air Force Reserve have been announced as: First Lieutenant **Joyce C. Barker,** Scottish Rite Hospital, Decatur, Georgia, who has been ordered to Letterman Army Hospital, San Francisco, California; and Second Lieutenant **Joan C. Wilson,** of Ridgewood, New Jersey, a recent graduate of Tufts College, Medford, Massachusetts, now assigned to duty at Brooke Army Hospital, San Antonio, Texas.

New Members

Michael Andreosky
Joseph Arav
Doris A. Bergstrom
Jean Botek
Joseph M. Breuer
Ruth I. Caraway
Julia V. Clayborne
Marian V. Cooper
Mrs. Sara F. Cornwell
Marilyn Lee Croxford
Robert G. Dicus
Paula J. Eldridge
Gudrun J. Erickson
Helen C. Farrell
Taimi T. Grekula
Isabel B. Grover
Lloyd M. Hall
Edward L. Herman
Walter J. Jadeson
Paul C. Keckley, Jr.
Frances Koerner
Irene M. Leaman
Bernadette Loosbrock
Mrs. Eileen G. Lynn
Mrs. Eugenia J. McClure
James McKillip, Jr.
Fredric E. Miller
Pauline J. Mitchell
Mrs. Enrica C. Nicholson
Mrs. Clarice S. Nielsen
Wayne H. Perdue
Theresa A. Pintado
Bill Poulopoulos
Irma Schnepper
Claralou Shannon
Mrs. Lucille D. Skophamme
Gerard E. Stavish
Helen Skrabut
Franklin J. Stupka
Shigeko C. Tanaka
Hilda S. Toker
Herbert Vanderwalde
Mrs. Margaret Wallace
Harold W. Whiting
Mrs. Evna E. Wilson

Marriages

Jean M. Erickson of Marshall, Mo., to James W. Long.
Vallie L. Elam of Oteen, N. C., now Mrs. Vallie E. Beckom.
Arlyne Israels of Rego Park, N. Y., now Mrs. Arlyne I. Hirschhorn.
Capt. Savinah Shockey, Mitchell Army Air Force Base, to Richard J. Harpending.
Marion L. Froberg of Newington, Conn., to Dean M. Gardiner, Tarkio, Mo.
Rosemary E. Forsyth, Alexandria, Ohio, now Mrs. Rosemary F. Leuchter, Baltimore, Md.
Sally Moseley, Raleigh, N. C., now Mrs. Sally M. Lowe.
Verniece Moody, Ballardvale, Mass., to Shields Moore Bishop, Columbus, Ohio.
Marie A. Sposato, now Mrs. Marie A. Szetela, Indianapolis.
Aurelia Meloy of Chicago to Ralph G. Mayer, Washington, D. C., Nov. 2.
Mary Alice Wright to Jerome Ellis Burwell, Oct. 14, Saybrook, Ohio.
Ariel Maxine Glick to Harvey Powers, Cedar Rapids, Iowa, Sept. 1.
Patricia Morrison to Terrance James Rooney, Chicago, Nov. 4.

New Student Members

Albany Hospital

Mary Bellas
Anne Marie Grimm
Rose Kavcsak
Shirley Nelson

Columbia University

Herman Weiss
Leonard Klatzkin
Shirley Needham
Annemarie Rumpler
Gertrude Funkey
Dena Levy
Marilyn Ricker

Duke University

Mary Margaret Bradley
Walter D'Mytryshyn
Eleanor Mae Flanagan
Betty Jean Messenger
Thomas Molloy Pogue
Grace Mabel Cunningham
Susan Felice Everhard
Emily Moody Johnson
Lois Ann Miller
Mary Jean Sullivan

Medical College of Virginia

Jack Dinerman
Bessie Ray Bass
James Donahue
Donald Kamholtz

Stanford University

Irene Gilbert
Joseph Browner

St. Louis University

Jean M. Clementz
John M. Gabala

Washington University

Kennett Ball
Charles A. Mendenhall
Elizabeth A. Houseman

University of Wisconsin

Roy E. Abdon, Jr.
Evone DePorter
Helen L. Lane
Edith B. Smith
Julane Wolfgram
Robert W. Case
Louis Cotovsky
Rosemary Dodds
Simon J. Dykstra
Catherine M. Echle
William P. Huss
Mary Ellen Davey
Jean Kelly
Joseph Rossi
Deanie Terrill
James P. Zimmerman
Gerald C. Miller
William G. Petuskey
Ruth Ann South
Janet E. Vogl
Jerome J. Hurley
Lee D. Jaeger

General News

Short Poliomyelitis Courses

Orthopaedic Hospital, Los Angeles, announces three short-term courses for 1951 in the treatment of poliomyelitis patients. Aided by a grant from the National Foundation for Infantile Paralysis, the five-day courses for qualified physical therapists will begin: February 12, May 21, and October 22, 1951.

The courses will include a comprehensive review of all phases of treatment with emphasis on teamwork by all services. The lectures and demonstrations will be presented concurrently for physicians, nurses, and occupational therapists.

For further information and enrollment write: Susan G. Roen, Director of Physical Therapy, 2400 South Flower Street, Los Angeles 7, California.

Temporary Army Promotions

The Department of the Army has announced the recent promotion of the following physical therapists to the temporary grade of Major:

Mary BenDure, Fitzsimons Army Hospital, Denver
Olena M. Cole, Fitzsimons Army Hospital, Denver
Christine D. Ehlers, Office of The Surgeon, Headquarters Third Army, Ft. McPherson, Ga.
Emma T. Harr, Letterman Army Hospital, San Francisco
Dorothy B. Locke, Letterman Army Hospital, San Francisco
Eleanor Marshall, 97th General Hospital, APO 757 c/o Postmaster, New York
Barbara M. Robertson, 1270 Colorado Blvd. #5, Denver
Dorothy G. Tipton, Madigan Army Hospital, Tacoma, Wash.
Eleanor Westfall, Army & Navy General Hospital, Hot Springs, Ark.
Anita Williams, U. S. Army Hospital, Sandia Base, Albuquerque, N. M.

The following were promoted to the temporary grade of Captain:

Amelia Amizich, Letterman Army Hospital, San Francisco
Mildred J. Anderson, Fitzsimons Army Hospital, Denver
Myrtle Bates, Wm. Beaumont Army Hospital, El Paso, Tex.
Dora K. Baugher, U. S. Army Hospital, Ft. Hood, Tex.
Ethel W. Coeling, Walter Reed Army Hospital, Washington, D. C.
Frances M. Davison, Madigan Army Hospital, Tacoma, Wash.
Marria M. Hoalt, Tokyo General Hospital, APO 1052 c/o Postmaster, San Francisco
Frances J. Johnson, Walter Reed Army Hospital, Washington 25, D. C.
Margaret E. Mahoney, Brooke Army Hospital, Ft. Sam Houston
Genevieve Pearson, U. S. Army Hospital, Cp. Atterbury, Ind.
Mary A. Perta, 98th General Hospital, APO 407 c/o Postmaster, New York
Alice Ruthe, Rodrigues General Hospital, APO 851, Miami
Mary Ellen Sacksteder, Osaka Army Hospital, APO 25 c/o Postmaster, San Francisco
Beatrice L. Sandhoff, Tripler General Hospital, APO 438 c/o Postmaster, San Francisco
Cathrine E. Spahr, U. S. Army Hospital, Ft. Campbell, Ky.
Phyllis R. Strobel, Brooke Army Hospital, Ft. Sam Houston

National Society Appointment

Appointment of Jayne Shover, an authority on the rehabilitation of handicapped children, as associate executive director of the National Society for Crippled Children and Adults is announced by Lawrence J. Linck, executive director. Miss Shover has been director of program services and the cerebral palsy division of the National Society for the past five years. In the newly-created post which she already has assumed, Miss Shover will have responsibility for the over-all advancement of the three-point program of direct services, education, and research of the National Society.

National Backing for Employing Disabled Is Pledged by Office Managers

Sponsorship of employment of disabled workers on a national scale was pledged by the National Office Managers Association during the National Business Show held in New York City in October.

The support of the National Office Managers Association, with its membership of thousands of office managers in all parts of the country, was pledged to the cause of aiding the disabled in a letter from T. W. Kling, Personnel-Education Director of the group, to Henry Viscardi, Director of the J.O.B. Committee, New York University-Bellevue Medical Center. J.O.B.—the initials stand for Just One Break—is a Medical Center group studying the best methods of placing disabled workers.

Mr. Kling wrote in his letter that he spoke for

the officers of the office managers association and stated that they "do not have in mind mere token support, but rather active participation to help widen and perhaps deepen the wealth of good that you and J.O.B. are doing."

UN Council Approves Rehabilitation Program

The Economic and Social Council of the United Nations at the Eleventh Session, held in Geneva in July and August of this year, considered the report of the Social Commission recommending the development of a program for the social rehabilitation of the physically handicapped.

On July 13, 1950 the Economic and Social Council adopted the following resolution concerning the Social Rehabilitation of the Physically Handicapped:

"*The Economic and Social Council*

"*Having considered* the report of the Social Commission, based on the recommendations of the Geneva meeting of the Secretariats of the United Nations, the specialized agencies and the United Nations International Children's Emergency Fund, with respect to the desirability of the United Nations, the specialized agencies and the United Nations International Children's Emergency Fund developing a broad, co-ordinated programme of rehabilitation of the physically handicapped, including the blind.

"*Requests* the Secretary-General:

"(1) To plan jointly with the specialized agencies and in consultation with the interested non-governmental organizations a well co-ordinated international programme for rehabilitation of physically handicapped persons;

"(2) To provide, in so far as the budget permits, the various types of service which are made available from time to time under resolution 58(I) and other available sources such as the expanded programme of technical assistance;

"(3) To expand the present facilities for dissemination of information on rehabilitation and the preparation of training materials;

"(4) To assist, as appropriate, in providing for the exchange of knowledge and materials for the manufacture of all types of prosthetic devices as well as information on hearing aids;

"(5) To include an amount in the budget estimates of the United Nations for 1951 for employing staff to initiate this programme; and

"(6) To report to the seventh session of the Social Commission the progress made in developing the programme in order that the Commission may advise the Council at its thirteenth session regarding further steps to be taken in implementing an effective international programme in this field:

"*Recommends* to the specialized agencies concerned that every effort be made to provide Governments, in need of and requesting expert assistance, with help and advice in the field of the social rehabilitation of the physically handicapped, including the blind; and

"*Recommends* to Member Governments that they should continue their efforts in the field of social rehabilitation of physically handicapped persons, including the blind, and in cases where they have not yet done so:

"(1) That they consider establishing or encouraging appropriate governmental or other organs to take the lead in studying and solving the problems confronting physically handicapped persons; and

"(2) That they consider appropriate measures including legislation for helping physically handicapped persons to solve the special problems with which they are faced."

It has been proposed that a Rehabilitation Section be established in the Division of Social Activities, Department of Social Affairs of the United Nations Secretariat, to carry out the recommended program. The final decision on the proposal is to be made by the United Nations General Assembly currently in session.

Pope Foundation Renews Research Grant

Results achieved under the research projects in heavy resistance exercises, carried out principally at the Massachusetts General Hospital, are of such permanent value that an additional grant has been approved by the Pope Foundation to explore new possibilities opened up by the earlier investigations.

The report on the progress of the research, which is being carried out by Thomas L. DeLorme, M.D., and Arthur L. Watkins, M.D., head of the department of physical medicine at Massachusetts General, points out that most of the major aims of the undertaking have been completed.

These investigations were based on the principle that restoration of muscle strength is a basic factor in the physical rehabilitation of victims of many types of injury and disease of both transient and chronic nature. In either case, improved technics for accomplishing this are of vital importance to any program of restoring function, whether the

patient is an athlete or a physically handicapped person trying to recover physical, social, and economic independence.

The major benefits of this type of treatment have been found to be (1) in weakened knee muscles due to the atrophic type of arthritis, (2) in weakened muscle groups due to the effects of poliomyelitis, (3) in restoration of strength, particularly in the quadriceps muscle and in the back after immobilization due to injury, (4) and in postoperative rehabilitation of weakened muscles and stiff joints.

The continuing research programs will be undertaken in cooperation with Yale University, Wesleyan University, and the United States Public Health Service.

Pan American Sanitary Conference Adopts Public Health Program

The thirteenth Pan American Sanitary Conference adopted a new program at its final plenary session in October which will lead to the improvement of public health services throughout the Western Hemisphere. The Conference authorized the Pan American Sanitary Bureau to:

(1) Supplement public health schools now functioning in some countries by furnishing technicians, granting fellowships for training teaching staff as well as students, promoting courses and seminars of continental interest, and subsidizing expansion and improvements of existing facilities for the training of health personnel;

(2) Encourage the development of regional training centers for public health personnel of different categories, recommending courses and demonstrations wherein basic knowledge is the subject taught rather than specialized studies, and utilizing those national centers having sufficient experience and qualified teaching staffs;

(3) Study the general and specialized educational centers connected with public health already existing on the continent which desire to serve as regional training centers and recommend the establishment of minimum requirements for the operation of regional centers;

(4) Recommend to Member Governments that priority be given to training technical and auxiliary personnel in public health service activities;

(5) Promote in various countries the appointment of adequately trained public health personnel chosen on the basis of their technical abilities and incorporate them into a full-time system of employment with guarantee of employment stability and adequate compensation.

New Army Physical Therapists

The physical therapy students participating in the training program conducted by the Army Medical Service completed the course November 4th and received their certificates of graduation from the Surgeon General. These officers, who are members of the Women's Medical Specialist Corps, attended the Medical Field Service School, Brooke Army Medical Center, Fort Sam Houston, for the first phase of the course. One group received their clinical training at Walter Reed Army Hospital, and the other group at Fitzsimons Army Hospital. All are second lieutenants; they have been assigned as follows:

Regina I. Bernat, Army & Navy General Hospital, Hot Springs, Ark.

Helen V. Bowman, Fitzsimons Army Hospital, Denver

Nancy S. Dority, Madigan Army Hospital, Tacoma, Wash.

Nellie A. Henson, Valley Forge Army Hospital, Phoenixville, Pa.

Freda L. James, Letterman Army Hospital, San Francisco

Dorothy M. Kinnison, Fitzsimons Army Hospital, Denver

Mary K. Leath, Letterman Army Hospital, San Francisco

Lorraine T. Leroux, Walter Reed Army Hospital, Washington 25, D. C.

Mary Mobbs, Walter Reed Army Hospital, Washington 25, D. C.

Don F. McElrath, Wm. Beaumont Army Hospital, El Paso, Tex.

Judith A. Ploss, Walter Reed Army Hospital, Washington 25, D. C.

Florence A. Schmidt, Letterman Army Hospital, San Francisco

Irene E. Waters, Murphy Army Hospital, Waltham, Mass.

Eugene Taylor Promoted

The promotion of Eugene J. Taylor to Assistant Professor of Clinical Physical Medicine and Rehabilitation, New York University College of Medicine, has been announced. Mr. Taylor is a member of the editorial staff of the New York Times, New York City Field Representative of the National Society for Crippled Children and Adults, and Consultant to the Health Resources Advisory Committee, National Security Resources Board.

News of Other Publications

Directory of Community Health Planning Councils. The National Health Council has just published this directory, an outgrowth of a survey of community health planning bodies which the Council completed recently. It is probably the first comprehensive listing of these organizations which has ever been printed, containing the names, addresses, and executives of 34 state and 1,190 community groups identified by the National Health Council during its survey. The "Directory of Community Health Planning Councils" will sell for $1.00 and may be purchased from the National Health Council, 1790 Broadway, New York 19, N. Y.

Neurology. The American Academy of Neurology has announced the establishment of its new publication, "Neurology," the first issue of which will be mailed January, 1951. The new journal, the only American publication devoted exclusively to neurology, will be published bimonthly. Its editorial scope will embrace every aspect of clinical neurology, including diseases of the nervous system, neuropathology, neurosurgery, neuroanatomy, neurophysiology, and neuropsychiatry. Russell N. DeJong, M.D., professor and chairman of the department of neurology, University of Michigan, will be editor-in-chief and Webb Haymaker, M.D., neuropathology chief, Armed Forces Institute of Pathology, Washington, D. C., will be associate editor. Under the editorial guidance of the Academy's own board, publishing will be by Lancet Publications, Inc., 84 South 10 Street, Minneapolis 3, Minn.

Survival under Atomic Attack. This well-outlined, clearly written booklet has been published by the United States Government Printing Office, and should be useful to civil defense and other emergency planning groups. The theme of "Survival under Atomic Attack" is "know the bomb's true dangers and the steps you can take to escape them." Copies are available at ten cents each, 25 percent discount for orders of 100 or more, from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

American Journal of Nursing, anniversary issue. Your attention is directed to the October 1950 issue of the "Journal of Nursing," celebrating the fiftieth anniversary of that publication. The issue will be of interest to readers because of its many features on the history of nursing and the interesting comparisons between past and present nursing trends.

School News

Bouve-Boston

The newest addition to the list of clinics now available to Bouvé-Boston senior physical therapy students for practice work is the physical therapy department at the new Joseph P. Kennedy, Jr., Memorial Hospital at 30 Warren Street in Brighton, Massachusetts. During the past year the modern Lawrence F. Quigley Hospital in Chelsea has also made its facilities available to Bouvé for clinical practice.

Dr. Thomas L. DeLorme, assistant in physical medicine at Massachusetts General Hospital, will give the lectures in electrotherapy to the junior physical therapy students this year.

The junior course in medicine will consist of lectures by Dr. Heinrich Brugsch, Assistant Professor of Medicine at Tufts Medical School; by Dr. Arthur L. Watkins, chief of the Department of Physical Medicine at Massachusetts General Hospital, and Associate in Medicine at Harvard Medical School; and by Dr. James Gowanus, Fellow for Rheumatic Diseases, New England Medical Center.

University of Pennsylvania

Due to a national emergency, the newly organized School of Auxiliary Medical Services of the University of Pennsylvania plans to admit students this coming February to a one-year certificate course in physical therapy, it was announced recently by the University.

Dr. Wesley G. Hutchinson, Dean of the School, said the decision to proceed forthwith to the enrollment of a physical therapy class for February was prompted by the present increased demand for physical therapists in United States military and veterans hospitals, as well as in centers actively engaged in the treatment of infantile paralysis cases.

The new February class, it was explained, will be open to college graduates having required credits in the physical and biological sciences, psychology, and social science. With the addition of this new class, Dean Hutchinson said, it will be possible to train nearly twice the present number of specialists in physical therapy.

First of its kind in United States medical history, the new School of Auxiliary Medical Services of the University of Pennsylvania was organized last July and officially began operations with the opening of the new 1950-51 academic year.

Index to Current Literature

Arthritis

Marie-Strumpell Arthritis: Follow-up Study of Roentgenographic, Physical and Orthopedic Therapy. Lenox D. Baker, R. W. Conrad, Robert J. Reeves, and W. A. Hoyt, Jr. Permanente Foundation Medical Bulletin, October 1950.

Limitations of Cortisone in Rheumatoid Arthritis. V. L. Snowden. Permanente Foundation Medical Bulletin, October 1950.

Resection Angulation Operation for Arthritis of the Hip. Henry Milch. Geriatrics, September-October 1950.

Rheumatic Valvular Disease in the Aged. Howard B. Sprague and David B. Carmichael. Geriatrics, September-October 1950.

Cortisone. Edward C. Kendall. Annals of Internal Medicine, October 1950.

Cerebral Palsy

The Care of the Cerebral Palsied Child in the U. S. A. Lawrence J. Linck. The Nervous Child, October 1950.

Electrotherapy

Static Electricity and High-Frequency Currents. Mathew B. Ray. British Journal of Physical Medicine, October 1950.

Iontophoresis. Eugene Eisenlohr. Clinical Medicine, October 1950.

Hemiplegia

Utilization of Reinforcement Techniques in the Program for the Hemiplegic. Jeanne Carroll. American Journal of Occupational Therapy, September-October 1950.

Miscellaneous

Is This Part of Your Antepartal Program. Mabel L. Fitzhugh. American Journal of Nursing, November 1950.

Integration of Body Mechanics and Posture in Nursing. Margaret C. Winters. American Journal of Nursing, November 1950.

The Square Hospital Means Economy. Jay W. Collins. Hospitals, November 1950.

What Social Security Means to Hospitals. Albert W. Whitehall. Hospitals, November 1950.

The Doctor and the Social Revolution. Paul R. Hawley. Connecticut State Medical Journal, November 1950.

Therapy of Parkinson's Disease. J. Ray Van Meter. California Medicine, October 1950.

Multiple Sclerosis

Multiple Sclerosis. Max Karl Newman, Sophia Radlow and H. Barbara Jewett. American Journal of Occupational Therapy, September-October 1950.

Multiple Sclerosis: A Correlation of Its Incidence with Dietary Fat. Ray Laver Swank. American Journal of Medical Sciences, October 1950.

Biochemical Studies in Multiple Sclerosis. Harold H. Jones, Harold H. Jones, Jr., and Leitha D. Bunch. Annals of Internal Medicine, October 1950.

Occupational Therapy

An Occupational Therapist's Approach to the Vocational Problems of the Cerebral Palsied. Katherine A. Connell. American Journal of Occupational Therapy, September-October 1950.

Daily Activity Inventory and Progress Record for Those with Atypical Movement. Mary Eleanor Brown. American Journal of Occupational Therapy, September-October 1950.

Orthopedics

Changes in Scoliotic Spine After Fusion. Ignacio V. Ponsetti and Barry Friedman. Journal of Bone and Joint Surgery, October 1950.

Sling Procedure for Correction of Splay-Foot, Metatarsus Primus Varus, and Hallux Valgus. Robert J. Joplin. Journal of Bone and Joint Surgery, October 1950.

Club Foot. An Embryological Study of Associated Muscle Abnormalities. Charles O. Bechtol and Harlan W. Mossman. Journal of Bone and Joint Surgery, October 1950.

Poliomyelitis

A Disease Epidemic in Iceland Simulating Poliomyelitis. B. Sigurdsson, J. Sigurdsson, J. H. Sigurdson, J. Thorkelsson, and K. R. Gudmundsson. American Journal of Hygiene, September 1950.

Poisoning As the Cause of Poliomyelitis. Ralph R. Scobey. Archives of Pediatrics, September 1950.

Investigation on the Cure and Treatment of Poliomyelitis Patients. Albert G. Bower, V. Ray Bennett, John B. Dillon, and Bernard Axelrod. Annals of Western Medicine and Surgery, October 1950.

Incidence of Subclinical Poliomyelitis in an Urban Area according to Age Groups. Albert E. Casey, William I. Fishbein, F. M. Schabel, Jr., and H. T. Smith. American Journal of Public Health, October 1950.

Rehabilitation

Rehabilitation in Respiratory Conditions. G. S. Todd, British Journal of Physical Medicine, October 1950.

Abstracts

Management of Acute Head Injuries

Prepared for the Committee on Trauma, American College of Surgeons, by a special committee of the Harvey Cushing Neurosurgical Society. In THE JOURNAL OF THE KANSAS MEDICAL SOCIETY, 51:9:421, September 1950.

Early ambulation is recommended after head injury. The patient should receive physical therapy in the form of active and passive exercises, early, and should be gotten out of bed into a chair as soon as he is able and willing to cooperate. Prolonged bed rest is conducive to traumatic neurosis.

Fractures of the Spine

Carruth J. Wagner, M.D., San Francisco. In THE AMERICAN JOURNAL OF SURGERY, 80:4:424, October 1950.

Fractures of the spine make up an important part of any orthopedic service. We have the impression that our results are much improved with the Watson-Jones method and are certain that the incidence of traumatic neuroses in the compensation cases has been decidedly lowered.

In using the Watson-Jones technic of closed reduction of lumbodorsal fractures, great care must be used to prevent hyperextension of the lumbosacral joint. Immobilization for four months with this joint in such a position will leave the patient with a disability that will exceed that of the fracture which is untreated. After removal of the plaster, flexion exercises should replace the hyperextension exercises the patient has been practicing during this immobilization.

Position of the Arm in Spastic Hemiplegia

Leonard J. Yamshon, M.D., Los Angeles. In ARCHIVES OF PHYSICAL MEDICINE, 31:10:658, October 1950.

Increased tone in the muscles of the arm in patients with spastic hemiplegia is postural in nature. The increased tone can be shifted from the flexors, internal rotators, and adductors to the extensors and abductors by elevating the arm 90 degrees. The exciting stimulus is proprioceptive in origin, and the pattern of extension or flexion probably is determined by the relationship to one another of the muscles around the shoulder girdle. This basic pattern can be modified but not altered by reflexes from other levels. Atrophy of disuse can be corrected and some voluntary control over gross movements obtained.

Contraindications for Physical Medicine in Neurological Conditions

Walter Freeman, M.D., Ph.D., Washington, D. C. In ARCHIVES OF PHYSICAL MEDICINE, 31:10:653, October 1950.

The contraindications to physical medicine in neurological disorders are found to lie chiefly in the psychic field. Some of these contraindications can be overcome by proper approach and preparation, but not all. The family setting also is worthy of study before an active program of rehabilitation is undertaken. Finally, the frustrating effect of physical therapy in the face of an advancing disability should be taken into account as far as the morale of the physiatrist and of his associates is concerned.

Generally speaking it may be said that when a disease process is stationary, physical methods are useful and necessary in helping the patient to overcome the residual disability, but, when the process is advancing, the psychological effects of failure are embarrassing to the therapist and disheartening to the patient and to the family.

Boundaries of Physical Medicine

Arthur L. Watkins, M.D., Boston. In ARCHIVES OF PHYSICAL MEDICINE, 31:10:623, October 1950.

We have been presented with numerous definitions of physical medicine, and there are even more for rehabilitation, as you all know. The confines of our specialty, however, still are not clear, and, accordingly, I am going to explore with you the boundaries of physical medicine by relating some of the achievements of our previous presidents.

The lesson to be learned from such a journey into the past seems to be that we in physical medicine fortunately are free of encircling boundaries, but to be successful physiatrists we must first of all be sound physicians, surgeons, or investigators, with a wide interest and knowledge of the practice of medicine.

The Influence of Certain Hyperkinemic Agents on Skin Temperature: Preliminary Report

Donald L. Rose, M.D., and Alma G. Jackson, M.A., Kansas City. In ARCHIVES OF PHYSICAL MEDICINE, 31: 10:641, October 1950.

Thirteen normal subjects were tested for their response to two hyperkinemic agents. The following conclusions are drawn from this study:

A derivative of nicotinic acid when applied topically as a 3 percent alcoholic solution is capable of inducing a prompt and prolonged cutaneous hyperemia and a mild, transient hyperkinemia.

The hyperemic but not the hyperkinemic properties of this solution are enhanced by the method of ion transfer.

The hyperkinemia is of less magnitude than that induced when histamine is similarly employed.

The 1 percent histamine ointment is a poor hyperkinemic agent in itself, but, under the influence of the constant current, exhibits excellent hyperkinemic properties.

Saline solution, when administered by the method of ion transfer, will induce both hyperemia and hyperkinemia, but the hyperemia is objectively and the hyperkinemia is subjectively not so intense as that noted following administration of the hyperemic solution or the histamine ointment.

Serum Neuritis: Report of Two Cases and Brief Review of the Syndrome

Kenneth R. Woolling, M.D., and Joseph G. Rushton, M.D., Rochester, Minn. In ARCHIVES OF NEUROLOGY AND PSYCHIATRY, 64:4:568, October 1950.

Most physicians are well aware that anaphylaxis and serum sickness may result from the prophylactic use of serum, but it is not well recognized that a disabling neuritis may also follow.

Two cases of neuritis of the shoulder following injection of tetanus antitoxin are reported. Neuritis should be recognized as a possible complication of the use of

serum. The condition may occasionally be confused with acute anterior poliomyelitis, but the historical sequence of serum injection, serum sickness and localized pain and weakness, developing over a period of one to three weeks, in the absence of the usual systemic symptoms and signs of poliomyelitis, should permit the correct diagnosis. In the acute phase, treatment is aimed at reducing allergic edema and pain; later, physical therapy is indicated.

Pain in the Neck and Shoulder

Harold N. Neu, M.D., Omaha. In THE NEBRASKA STATE MEDICAL JOURNAL, 35:10:312, Ocober 1950.

The problem of neck and shoulder pain commands the interest of the general practitioner, the internist, the orthopedist, the radiologist, the neurologist, and many others in the practice of medicine. It is not the province of the chiropractor as often is popularly thought.

It is also recognized that a stiffening of the shoulder and painful shoulder occur quite frequently after myocardial infarction. It is believed that the pain associated with the infarction sets off a series of reflexes which cause considerable vasospasm in the tissues about the shoulder joint. This in turn creates a fibrostatic reaction with the resulting pain and limitation of motion. I rather doubt that all of these cases of the so-called post-infarction syndromes are actually that. It may well be the result of placing a patient with a coronary thrombosis in bed for three to six weeks in relative immobility without activity of his shoulders. There is little reason why the average patient with coronary occlusion should not go through a daily set of shoulder exercises to maintain the normal activity and range of motion of the shoulder. This same type of problem applies also to our management of the hemiplegic patient who is allowed to remain quiet without immediate attention to physical therapy. Dinken has emphasized how important it is that the education and rehabilitation of the hemiplegic patient be instituted as rapidly as possible.

Respiratory Paralysis in Poliomyelitis in 1948

W. Bolt and H. Valentin. In KLINISCHE WOCHENSCHRIFT, Heidelberg, 28:113, February 15, 1950. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 144:6:501, October 7, 1950.

Bolt and Valentin describe spirographic investigations which they carried out during the 1948 epidemic of poliomyelitis in patients with respiratory impairment. Their aim was to obtain objective information on respiratory limits, vital capacity, frequency, depth of respiration, and respiratory minute volume and to determine the presence of a spirographic oxygen deficit. It was hoped that information about these factors would give exact information about the quantitative restriction of the respiratory function and permit a precise prognosis as to whether the respiratory disturbances would limit survival.

The authors present spirographic records indicating the effects of oxygen inhalation, of artificial manual respiration, of the use of the iron lung, the pulmotor, and other methods. Spirography permits objective determination as to when and how long a patient must be kept in the iron lung. Patients have been kept in the iron lung longer than necessary. The selection of patients for such treatment will be facilitated by concrete information. This is important when there are more urgent cases than there are iron lungs. The authors emphasize that sudden cessation of measures to aid the respiration must be avoided, because fatalities have been known to result from such practice.

The Scope and Future of Physical Medicine and Rehabilitation

Frank H. Krusen, M.D., Rochester, Minn. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 144:9:727, October 28, 1950.

Because of his qualifications and training, the physiatrist is especially well qualified to collaborate with and to supplement the work of certain other specialists. The equipment of the physiatrist is so complex and his training so extensive that the specialist in these other fields cannot expect to absorb this specialty and incorporate it with his own any more easily than he could absorb and incorporate all the complicated technics of the roentgenologist or the clinical pathologist. There is no more justification for specialists in other fields of medicine to utilize the services of the technical workers in physical medicine without consulting the physiatrist than there would be for their utilizing the services of the technical workers in the departments of roentgenology and the clinical laboratories without consulting the roentgenologist or the clinical pathologist.

It is obvious that the scope of our new medical discipline is enormous and that the future of our specialty is promising. Our recent progress has been truly phenomenal, and this field, which is based on the medical applications of physics, should continue its expansion and in the future should attain new heights.

At this moment, we physicians who specialize in physical medicine and rehabilitation are riding on the crest of the flood, and our future should be extremely bright if we continue to bend every effort to promote good practice, sound teaching and conscientious research. We must not omit any step in collaborating with our colleagues in other specialties which will advance the welfare of our patients.

Poliomyelitic Hip Deformity and the Erector Spinae Transplant

Joseph S. Barr, M.D., Boston. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 144:10:813, November 4, 1950.

One of the most intractable sequelae of poliomyelitis is a complex deformity involving the knee, the hip and the lumbosacral portion of the spine.

There can be no doubt that skilled nursing care and physical therapy will prevent the development of contractures and deformities in the majority of cases. But once a flexion deformity of the hip and knee has been established in the growing child, conservative measures such as stretching and manipulation are seldom, if ever, effective in its permanent relief.

During the period of growth, soft tissue as well as bony structures must be regularly subjected to physiologically normal function or its form will undergo alteration.

The prevention of fascial contractures after acute poliomyelitis requires painstaking supervision.

Once contractures involving the iliotibial band have become established, they tend to increase throughout the growing period and cannot be overcome by conservative measures.

Operative correction of deformities by fasciotomy is subject to a high recurrence rate.

The erector spinae transplant combined with suitable release of soft tissues is most useful in the correction of poliomyelitis contractures of the hip with accompanying deformity of the lumbar portion of the spine and the knee and is recommended as the operation of choice in these cases.

Virology of Poliomyelitis

Charles F. Pait, M.D., Los Angeles. In CALIFORNIA MEDICINE, 73:5:391, November 1950.

The virus of human poliomyelitis has been demonstrated in excretions before onset of the disease, during the disease, and in convalescence. It may be confused with different viruses likely to be found in the same sources in clinical conditions resembling poliomyelitis.

Immunologic differences between strains of poliomyelitis virus have been detected so that three types are now evident. The distribution of these types and their importance as causes of epidemics are not known. This multiplicity of immunologic types is an important factor in considering immunization of humans. Commercial manufacture of vaccines faces many technical problems.

Recently the Coxsackie virus has been demonstrated in humans with a disease closely resembling poliomyelitis.

The Diagnosis and Treatment of Ruptured Cervical Disk

James L. Thomson, M.D., Norfolk. In VIRGINIA MEDICAL MONTHLY, 77:10:537, October 1950.

Treatment for this lesion is either conservative or operative depending on the individual case. The chronic pain or subacute one should have bed rest for some time, using neck or skeletal traction as indicated. If the symptoms subside, a collar may be worn for some time to afford comfort. Physical therapy in the form of diathermy and hot packs is helpful. It is dangerous to manipulate the neck as the segmental pain may be converted into cord compression by massive herniation of the herniated nucleus, with resulting severe cord damage.

Operative treatment is desirable in the acute case which is not relieved by a few days bed rest.

A Histologic Study of Muscles and Nerves in Poliomyelitis

John Denst, M.D., and Karl T. Neubuerger, M.D., Denver, Colo. In THE AMERICAN JOURNAL OF PATHOLOGY, 26:5:863, September 1950.

The pathologic changes in voluntary muscles and nerves in poliomyelitis have received little attention in comparison with the lesions in the central nervous system. Extensive biopsy studies were made by Kopits in cases of several years' duration, and by Hipps who correlated anatomical features with muscular function and clinical treatment. Hassin and Horanyi-Hechst found muscle alterations in acute cases, and Flynn reported advanced degeneration in many muscles of a patient who died 5½ months after the onset of the disease. Clawson, Noble, and Lufkin examined samples of seven muscles from 22 cases of acute poliomyelitis and found areas of focal myositis in 2 patients. Important contributions in this field include also those of Carey, Massopust, Zeit, and Haushalter, who found disintegration of the motor end-plates of human beings and monkeys in the earliest stages of the disease. Dublin, Bede, and Brown observed degeneration of the myoneural junctions, nerve fibers, and muscles in biopsy specimens from 3 patients who had had poliomyelitis for from 5 to 7 weeks.

Voluntary muscles and peripheral nerves of 14 fatal cases of acute and chronic poliomyelitis were examined histologically.

The muscular changes consisted of early fatty metamorphosis, followed by varying degrees of degeneration, atrophy, and late fibrosis. Plasmodial formations of sarcolemmal nuclei in connection with disintegration of muscle fibers were seen frequently. Hypertrophic fibers were found in late cases. Proof of true regeneration was lacking. The histologic picture, as a rule, resembled that of the neurogenic forms of muscular atrophy, but occasionally was reminiscent of that of progressive muscular dystrophy.

The nerves showed very early stripe-shaped demyelination and relatively minor change in the axis cylinders. The lesions in the nerves appeared less severe and less extensive than those in the muscles. The pathologic process appeared to be different from Wallerian degeneration.

The possibility of direct action of the virus on muscles and nerves must be considered.

Physical Medicine and Rehabilitation in the Veterans Administration

Louis B. Newman, M.E., M.D. ILLINOIS MEDICAL JOURNAL, 98:2, August 1950.

At the present time, there are approximately 104,000 veterans hospitalized in the United States. In addition to the already existing number of disabled veterans, 265,000 men were permanently disabled during World War II. It has been reliably estimated that the number of hospitalized veterans will be on the increase and that the maximum load will be about the year 1975. The job of rehabilitating these veterans, therefore, has only begun.

The goal of physical medicine and rehabilitation in the Veterans Administration is the restoration of the disabled veteran to as full a life as possible. Merely an existence or the prolongation of life is not sufficient. To secure for these veterans a measure of happiness, contentment, and satisfaction is paramount. It is the desire and hope to return these individuals to their respective communities as useful citizens, inculcated with the feeling that there is a definite place for them in this world. As has been very aptly stated, we must give "life to years."

Motivation and stimulation of the patients in order to secure maximum cooperation is vital. An interested patient is usually a cooperative one. It is our duty to stimulate interest and to arouse enthusiasm in the patient toward his recovery and well-being. The patient must believe and have faith in you and your planned program.

A most complete and careful evaluation of the disability before instituting treatment is fundamental. In physical medicine and rehabilitation rarely does an emergency exist necessitating immediate treatment. Therefore, time should be taken in order to make a very careful study of the total individual in so far as function and usefulness is concerned; range of motion and muscle strength should be carefully measured and recorded; coordinated movements should be studied.

The promptness with which rehabilitation is instituted can not be overemphasized. Rehabilitation procedures must be started early in order to secure maximum results with the least amount of residual handicap.

Indicated prescribed treatment must be carried on for a sufficient length of time. A common error is to discontinue treatment before maximum results have been accomplished.

Complete integration of all activities and services, such as: Medical, Physical Medicine and Rehabilitation, Psychiatric, Nursing, Social Service, Vocational Advisement, etc., into a closely organized team with the physiatrist in charge is paramount. In order to further direct every available service toward the maximum rehabilitation of each patient, a Rehabilitation Board has been established, with the Chief of the Physical Medi-

cine and Rehabilitation Service as Chairman. The function of this board is to plan, initiate, and evaluate periodically a specific rehabilitation program for the veteran; to guide and advise the patient throughout his period of hospitalization; to assure that the maximum benefits of all services are brought to bear upon the individual patient's case in achieving his rehabilitation; to coordinate the rehabilitation program in the hospital with the post-hospital plans of the veteran. Social and psychological preparation and adjustment, including vocational guidance and placement is of extreme importance.

Rehabilitation must be a dynamic, moving, forceful, ever-changing program, and we, the doctors, must have vision and keep our minds open for new ideas and continually seek for more effective methods of diagnosis and treatment in order to attain the goal of maximum usefulness for the disabled.

Universal Medicine

A universal "medicine" good for treating all diseases has been reported by Dr. W. W. Bauer of Chicago, director of the American Medical Association's Bureau of Health Education.

The prescription goes something like this: Take three parts of the kindliness, personal interest, and knowledge of human nature of the old-fashioned horse-and-buggy doctor, mix well with one part of the spirit of service and self-sacrifice, and apply liberally to the human factor involved in every illness.

Results are guaranteed to be gratifying, Dr. Bauer indicated, whether the treatment is known by the older name "general practice" or the newer term, "psychosomatic medicine."

Writing in the September issue of *Today's Health,* American Medical Association magazine of which he is editor, Dr. Bauer cited the comeback of the family doctor as evidence that the prescription is effective.

Antibiotic drugs, atomic energy in medicine, and other great scientific advances of the past fifty years enable the modern doctor to relieve suffering and save lives in many situations in which he would have been helpless a half-century ago, Dr. Bauer pointed out. These victories and the growth of specialism in medicine have not subtracted from the responsibilities of the family doctor as was believed until recently. They have added to them.

"A few years ago the last sad rites were read again over the supposed professional remains of an American institution known as the general practitioner of medicine," Dr. Bauer said.

"The general practitioner was not and is not dead. Neither will he be. He is as necessary in an age of specialization as he ever was; in many ways even more so.

"The growing concept of psychosomatic medicine, with its accent on the kind of patient who is ill rather than on the illness which afflicts the patient, should make the family doctor of one hundred years ago, if his spirit could be hovering nearby, smile a bit tolerantly. He always knew that it was folks that mattered, and that the doctor who understood and genuinely liked people was a better doctor than he who did not, even when their medical knowledge was identical.

"What has the general practitioner to offer the American family?

"Eighty-five percent of the ills from which human beings suffer can be cared for by the modern family doctor with no more equipment than what he ordinarily carries in his bag. Perhaps the most important service the general practitioner renders is not a service at all, but a relationship which permeates all services. This is his function as friend and confidant, who becomes well acquainted with the family, interested in all its members, cognizant of their problems, and always ready to help.

"The old-time general practitioner, especially in smaller towns, was not only doctor but philosopher and general all-around 'Mr. Fixit' for his patients. As community conditions have changed, this relationship has changed, but it still remains fundamental to the best medical care. It is the threat to personal relationship between doctor and patient which has been one of the principal bases for medical opposition to compulsory health insurance. Anyone who has ever been ill knows that without confidence in the doctor, half the battle is lost. Conversely, with such confidence, the chances for good progress are greatly enhanced.

"The ordinary illnesses of children can be cared for by the general practitioner, and in most instances do not require the services of a specialist. Ninety percent of well-baby care in the United States is by general practitioners. Under this care and supervision, the infant death rate has fallen year by year to new lows, and continues to fall.

"For the adult, the general practitioner should be the first resort when illness threatens. If the patient tries to select his specialist direct he may simply go to the wrong source and have to be referred again.

"The newly aroused interest in the general practitioner does not mean a return to the past. There is plenty of room in the medical picture for many of the personal qualities of the old-time practitioner, but to these will be added modern scientific training and experience."

Book Reviews

Neurology. *By R. R. Grinker, M.D., and Paul C. Bucy, M.D. Pp. 1138. $12.50. Charles C Thomas, Springfield, Illinois, 1949.*

This fourth edition of Grinker's *Neurology* is an improvement on what had already become a standard and well-accepted book in the field of medical neurology. One can hardly review such a textbook without going into a lengthy discussion of the format, presentation, lucidity, coverage of the field, and so on. When one would finish with such a review he could only conclude with the statement that it is one of the finest books available on the subject.

This edition presents some major changes. For the first time there is a co-author, Dr. Bucy. In the preface this is explained by the authors as being due to Dr. Grinker's transference of his interest in neurology to that of psychoanalysis and with it his presumption that medical neurology is extinct as a specialty because its disciplines have been absorbed by general medicine. Perhaps the senior author is only describing his own rationalization for giving up a field in which he was quite experienced. This leaves only psychoanalysis and operating neurologists. It is presumed that the operating neurologists have a short lease on life until they are swallowed up by the general surgeons. Whatever may be the reasons for adding Dr. Bucy to the authorship these should not detract from the fact that this operating neurologist has added an impetus to make some important and welcome changes in bringing the book up to date. The influence of this author is particularly evident in the sections on the motor system and intracranial tumors. The section on syphilis is somewhat antiquated, particularly from the point of view of therapy, even though the book was published in 1949. As usual the bibliography and index are excellent.

There is no doubt that whatever criticisms one may have they are only minor in the presence of such a generally valuable book on medical neurology. It should be in the library of all physicians.

Reviewed by IRVING C. SHERMAN, M.D., *Assistant Professor, Department of Nervous and Mental Diseases, Northwestern University Medical School.*

Recent Advances in Physiology (Seventh edition). *By W. H. Newton, M.D., M.Sc. (Manch.), D.Sc. (Lond.), Professor of Physiology in the University of Edinburgh. Cloth. Price, $4.50. Pp. 268 with 90 illus. The Blakiston Company, Philadelphia, 1950.*

This little book of 268 pages, which is an entirely rewritten, new edition of a book that has occurred periodically (the sixth edition appeared in 1939), has a peculiar place in the review literature of physiology. It does not compare in exhaustiveness, of course, with the Annual Review of Physiology, nor does it have the up-to-dateness of the individual reviews in the "Physiological Reviews." It should be considered as the analyses and musings of a senior physiologist covering the entire field of physiology.

Obviously, a book like this is quite incomplete and the author does not have to offer any apologies for this. On the other hand, it does give a careful analysis of the trend of thought in physiology and as such is a valuable contribution. There are ten chapters dealing with the physical basis of temperature regulation, water diuresis, digestion, physiology of pregnancy, blood pressure and kidneys, catheterization of the heart, electrical excitation of nerve, cutaneous sensation, auditory impulses, and color vision. The book is very well written, and the author has taken the time to really digest and analyze what the meaning of the many contributions and developments in physiology are.

Naturally, individual physiologists would not always agree with the author in his analysis of the data. Some auditory physiologists, for instance, might not consider Hartridge's experiment on sudden phase reversal at all conclusive, and some physiologists might not agree with the statement that the evidence for the importance of the notes of Ranvier in nerve conduction is really satisfactory. But these are differences of opinion that will occur in any rapidly developing field.

For physical therapists who want to have an authoritative review of what is going on in physiology, without going into a large amount of detail, this book will be a very valuable help.

Reviewed by HARRY D. BOUMAN, M.D., *Professor of Physical Medicine, University of Wisconsin Medical School.*

Cerebral Palsy. *By John F. Pohl, M.D., Orthopedic Surgeon, Michael Dowling School for Crippled Children; Diplomate, American Board of Orthopedic Surgery; Member, American Academy of Orthopedic Surgeons; Associate Member, American Academy for Cerebral Palsy. 200 pp., illus. 131. Price $5.00. Bruce Publishing Company, Minnesota, 1950.*

Observations on the management of 144 children over a period of twelve years are set forth in this book by a man who has great interest in neuromuscular problems. A statement of the general medical problems covers the etiology, pathology, and clinical picture of the various types in a simple, understandable manner. Sensorimotor aspects and mental retardation problems are well illustrated. In Dr. Pohl's series, 41 percent of the children were termed essentially uneducable.

General principles of treatment are based on three procedures: (1) Secure muscular relaxation, (2) train voluntary muscular control, and (3) build developmental patterns. Steps for securing first, general relaxation, then, voluntary inhibition of individual muscle groups are outlined, with cognizance taken of differences in spastic and athetoid types. Specific muscle training is quite detailed and is given for each bodily segment, presupposing an ability to isolate muscles which is seldom found in cerebral palsy. A rigid plan of passive, then active motion, similar to that used in poliomyelitis, is given. The building of developmental patterns follows the stages of normal child development which lead to independent walking, presenting functional activities such as rolling, creeping, knee-standing, and balancing. Aids to independent walking are well described and illustrated.

The chapter on occupational therapy, while sketchy, includes an outline of activities for obtaining various

arm and hand movements which will be useful to the physical therapist who is working alone. Laterality and normal ages of development of the various activities are stressed.

The speech section, written in association with E. Margaret Sullivan, covers the speech problems most frequently met in cerebral palsy: delayed speech, deafness, aphasia, stuttering, articulatory defects, and breathing and voice disorders. Basic technics in examination and therapy are ably presented.

Conspicuous by their absence are discussions of bracing and functional equipment.

The book is profusely illustrated and written in an easily readable style. It is recommended for every therapist who accepts the responsibility of treating the whole child.

Reviewed by HARRIET E. GILLETTE, M.D., *Aidmore Crippled Children's Home and Hospital, Atlanta, Georgia.*

Radiographic Atlas of Skeletal Development of the Hand and Wrist. *By William Walter Greulich, M.A., Ph.D., Professor of Anatomy, Stanford University School of Medicine, and S. Idell Pyle, M.S., Research Associate, Brush Foundation and Department of Anatomy, Western Reserve University School of Medicine. Cloth. Price $10.00. 10 figures, 55 plates, and xiii + 190 pages. Stanford University Press and Oxford University Press.*

This *Atlas* is based on the serial hand X rays gathered by the late Dr. T. Wingate Todd, formerly Director of the Brush Foundation. The ossification centers of the hand and wrist are accepted as representative of the process of skeletal maturation (biological ageing) in general. There are 28 standard (or "norm") X rays for males, 27 for females. In both sexes the age-range is newborn to eighteen years. In addition, pp. 149-190 are given over to a detailed analysis of maturity indicators of individual bones and epiphyses of radius, ulna, carpals, metacarpals, and phalanges.

In cases where it may be necessary to establish the biological age of the child—in contradistinction to the chronological age—the present *Atlas* is the most carefully analyzed and clearly presented. Its precise use demands a thorough knowledge of the osteology of the hand, plus a working familiarity with the roentgenology of the part. The physical therapist may find the volume of use in traumata of the immature and growing hand. In large measure, however, the book will serve to acquaint the therapist with the picture of the immature hand skeleton as opposed to the adult condition.

Reviewed by WILTON MARION KROGMAN, PH.D., *Professor of Physical Anthropology, Graduate School of Medicine, University of Pennsylvania.*

Counseling the Handicapped in the Rehabilitation Process. *By Kenneth W. Hamilton, Associate Professor of Social Administration, Ohio State University, 296 pp., with 4 illus. Cloth $3.50. The Ronald Press Company, New York, 1950.*

Psychiatrists, therapists, social workers, and counselors should find a wealth of useful material in Kenneth Hamilton's volume, *Counseling the Handicapped in the Rehabilitation Process.* Here he has succeeded in pointing up the need for coordinated and individualized care for the handicapped.

Students of this subject, whether they be academic or professional will find a refreshing and utilitarian approach to the counselor who is seen by the author as an intermediate functionary—the link between the individual under supervision and the agencies which purport to aid him. It should prove an invaluable aid and "guide" book to anyone interested in understanding the problems related to the nature and purpose of rehabilitation.

Of special utility and functional value are the chapters devoted to "The Rehabilitation Center" and "The Disabled Worker on the Job." It is a noteworthy factor that Mr. Hamilton knows his subject and is adept at bringing about a comprehension of the vastness of the task involved within the scope of his subject matter.

Despite his scholarly approach, the author never loses sight of the human dignity of the disabled individual nor of the fact that vocational adjustment can best be attained where the employment goal of the individual is on the highest level of competitive performance.

It is pleasing to note that in his discussions of the major facets of the Rehabilitation Problem the counselor is given definite scope. Mr. Hamilton is capable of separating the *ing* from the *or* in the attachment of counsel. The "counselor" should be chosen because of his competency in the subjective and adjustmental skills implied in social case work. Then must be found the aptitudes and skills of vocational adjustment.

Within the covers of this volume can be recognized the size of the rehabilitation program and its relation to our economy. What at one time was considered in the mistaken guise of a national disaster can, with competent guidance, become a national asset.

Reviewed by ANTOINETTE RAJEK, *Medical Social Worker, Passavant Memorial Hospital, Chicago.*

Preventive and Corrective Physical Education. *By George T. Stafford, Ed.D., Professor of Physical Education, University of Illinois. Revised Edition, fabrikoid. Price, $3.75. Pp. 312, illustrated with photographs and drawings by Gene A. Logan. A. S. Barnes and Company, 1950.*

Preventive and Corrective Physical Education is a book written largely for the guidance of the physical educator. The book will be found of value to those who have charge of departments of corrective physical education. Dr. Stafford has had a very wide, long, and valuable experience in physical education and is ably suited to write authoritatively in this field.

There are nine chapters as follows: new hope for the handicapped, physical medicine, preventive and corrective physical education, body mechanics, the treatment of faulty body mechanics, the feet, heart disturbances, malnutrition, and poliomyelitis and cerebral palsy. Each chapter closes with a large number of references for further study.

The author states that the book is also written for nurses, physical therapists, and occupational therapists. The book will have a certain value to physical therapists whose training and experience make them discriminatory readers. It is not a book for the guidance of the novice.

It seems unfortunate to the reviewer that the chapter on physical medicine was included because it is immature, inaccurate, and misleading in many instances. This is particularly true in the section covering electrotherapy.

Reviewed by STAFFORD L. OSBORNE, M.D., *Department of Physical Medicine, Northwestern University Medical School.*

SCHOOLS APPROVED FOR TRAINING PHYSICAL THERAPISTS

By Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requirements	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
CALIFORNIA							
[1]Childrens Hospital Society, Los Angeles	Samuel S. Mathews	Sarah S. Rogers	a[6]-b[6]-d	14	Sept	$300	Cert. or Degree
[1]College of Medical Evangelists, Loma Linda, Calif.	F. B. Moor	R. Wm. Berdan	a-b-c-d	12	Sept	$225	Cert. or Degree
[1]Univ. of So. California, Los Angeles ..	Charles L. Lowman	Charlotte W. Anderson	a-b-d-e-g[6]	14	Sept	$594	Cert. or Degree
[1]Univ. of California Med. School, San Francisco	Lucile M. Eising .	Margery Wagner	d-e	12	Sept	$220[2]	Cert. or Degree
[1]Stanford Univ., Stanford (Palo Alto) ..	Wm. Northway ...	Lucille Daniels	a-d-e-f-g[6]	12	Jan June Sept	$620	Cert. or Degree
COLORADO							
[1]Univ. of Colorado Med. Center, Denver	Harold Dinken ...	Mary Lawrence	a-b-d	12	Sept	$300	Cert. or Degree
ILLINOIS							
Northwestern Univ. Med. School, Chicago	Emil D. W. Hauser	Gertrude Beard	a-b-d-e	12	Oct	$450	Cert.
IOWA							
[1]Univ. of Iowa Med. School, Iowa City	W. D. Paul	Olive C. Farr	a[6]-e	12	Sept	$200	Cert.
KANSAS							
[1]Univ. of Kansas, School of Med., Kansas City	Donald L. Rose ...	Lilyan G. Warner & Ruth Monteith	a-b-d-g[6]	12	Feb Sept	$60[2]	Cert. or Degree
MASSACHUSETTS							
Bouve-Boston School of Phys. Educ., Boston	Howard Moore ...	Constance K. Greene .	g[5]	36	Sept	$550	Degree
Simmons College, Boston	Wm. T. Green ... / Arthur L. Watkins	Janet B. Merrill	a[6]-b-d-g[6]	16-36	Sept	$650	Cert. or Degree
Boston Univ. College of Phys. Ed. for Women: Sargent College, Cambridge	Kenneth Christophe	Adelaide McGarrett .	a-b-d-f-g[6]	12 4 yrs.	Sept	$495	Cert. or Degree
MINNESOTA							
[1]Univ. of Minnesota, Minneapolis	Frederic J. Kottke	Ruby M. Green	d-f-g[6]	2 yrs.	Sept	$126[2]	Degree
[1]Mayo Clinic, Rochester	Earl C. Elkins	Harry Keown	a-b-c-d-e	12	Sept	$250	Cert.
MISSOURI							
[1]Washington Univ. School of Medicine, Barnes Hospital, St. Louis	Sedgwick Mead ..	Beatrice F. Schulz ...	f	2 yrs.	Sept	$450[4]	Degree
[1]St. Louis Univ. School of Nursing, St. Louis	A. J. Kotkis	Sr. Mary Imelda	g[6]	36	Jan Sept	$300	Degree
NEW YORK							
Albany Hospital, Albany	John W. Ghormley	Catherine Graham ...	a-b-d	12	Sept	$250	Cert.
[1]Columbia Univ., New York	Wm. B. Snow	Floy Pinkerton	a-e-f	1 or 2 yrs. Sept		$450	Cert. or Degree
[1]New York Univ. School of Education, New York	George G. Deaver	Elizabeth C. Addoms .	a[6]-b-d-g[6]	12	Sept	$589	Cert. or Degree
NORTH CAROLINA							
[1]Duke Univ. School of Med., Durham	Lenox Baker	Helen Kaiser	a[6]-b[6]-d	15	Oct	$350	Cert.
OHIO							
[1]Cleveland Clinic, Cleveland	S. G. Gamble	Mildred Heap	a-b-c	12	Oct	$200	Cert.
PENNSYLVANIA							
[1]D. T. Watson School of Physiatrics, Leetsdale	Jessie Wright	Kathryn Kelley	a[6]-b[6]-d	12	Oct	$300	Diploma
[1]Univ. of Pa. School of Auxiliary Med. Services, Div. of P.T., Philadelphia	George M. Piersol	Dorothy Baethke	g[6] / e	4 yrs. 12	Sept Sept	$608[7] $000[7]	Cert. & Degree Cert.
TEXAS							
[1]Hermann Hospital, School of Physical Therapy, Houston	Oscar O. Selke, Jr.	Mary Elizabeth Kolb .	a-b-d	12	Oct	$300	Cert. or Degree
[1]Univ. of Texas School of Med., Galveston	G. W. N. Eggers ..	Ruby Decker	a-b-d	12	Jan	$162[2]	Cert.
VIRGINIA							
[1]Baruch Center of Physical Med. of Medical College of Virginia, Richmond ..	Walter J. Lee	Susanne Hirt	a-b-c-g[6]	12	Sept	$275[2]	Cert. or Degree
WISCONSIN							
[1]Univ. of Wisconsin Med. School, Madison	Harry D. Bouman	Margaret Kohli	a-b-f-g[6]	12	Sept	$120[2]	Cert. or Degree
MEDICAL DEPARTMENT—U. S. ARMY							
(a) Medical Field Service School, Brooke Army Medical Center, San Antonio, Texas, and	James E. Tate, Lt. Col., M.C.	Agnes P. Snyder, Major, WMSC	b-e	12[8]	Aug Mar	None	Cert.
(b) Fitzsimons General Hospital, Denver, Colorado, or	H. B. Luscombe, Colonel, M.C.	Olena M. Cole, Captain, WMSC	Completion of Medical Field Service School				
(c) Walter Reed General Hospital, Army Medical Center, Washington, D. C.	John H. Kuitert, Lt. Col., M.C.	Brunetta Kuehlthau, Major, WMSC	Completion of Medical Field Service School				

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For Two-year Course: f=Two years of college with science courses.

For Four-year Degree Course: g=High school graduation.

[1]Male students admitted.

[2]Nonresidents charged additional fee.

[3]Certificate granted by Childrens Hospital Society; degree granted by University of California at Los Angeles.

[4]Tuition reduced second semester of second year.

[5]12 months includes training at the Medical Field Service School and Fitzsimons or Walter Reed General Hospitals.

[6]Additional college science required.

[7]Plus additional University fees.

[8]Advanced standing students accepted.

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Arey, Leslie B., Ph.D., Robert L. Rea Professor of Anatomy and Chairman of the Department of Anatomy, Northwestern University, Chicago, Illinois. Dr. Arey received his bachelor's degree from Colby College and his Ph.D. from Harvard University. He has also been the recipient of an honorary degree of Doctor of Science from Colby.

Cohen, Rhoda Leah, Director of Physical Therapy, House of St. Giles the Cripple, Brooklyn, New York. Miss Cohen was graduated from Brooklyn College with a B.S. degree, and she took her physical therapy training at Mayo Clinic, where she later served as a physical therapist. She is a member of the American Physical Therapy Association, the National Society for Cerebral Palsy, and the American Registry of Physical Therapy Technicians.

von Werssowetz, Odon F., M.D., Chief, Physical Medicine Rehabilitation Service, Thayer Hospital, Nashville 5, Tennessee. Dr. von Werssowetz received his B.A. in philology from Copernicus College, an M.B. from the University of Charles IV, a B.A. in biological and medical sciences and an M.D. from the University of Toronto. He is a licentiate of the Medical Council of Canada and a Diplomate of the American Board of Physical Medicine and has done postgraduate studies at the University of Western Ontario, Mayo Foundation, and New York University. Dr. von Werssowetz served with the United States Army for three years, and was Chief, Physical Medicine, at the Baroness Erlanger Hospital in Chattanooga until he assumed his present position. He is Assistant Editor, "International Review of Physical Medicine and Rehabilitation"; Secretary, Southeastern Section of the American Congress of Physical Medicine; Fellow, American Medical Association; Associate, American College of Physicians; Member, American Physical Therapy Association; American Society of Physical Medicine; British Association of Physical Medicine; Nashville Academy of Medicine; Southern Medical Association; Association of Military Surgeons; and Tennessee Medical Association.

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PHYSICAL THERAPIST, crippled children's home, apply Martha Washington Home, 4515 Drexel Blvd., Chicago 15, Ill.

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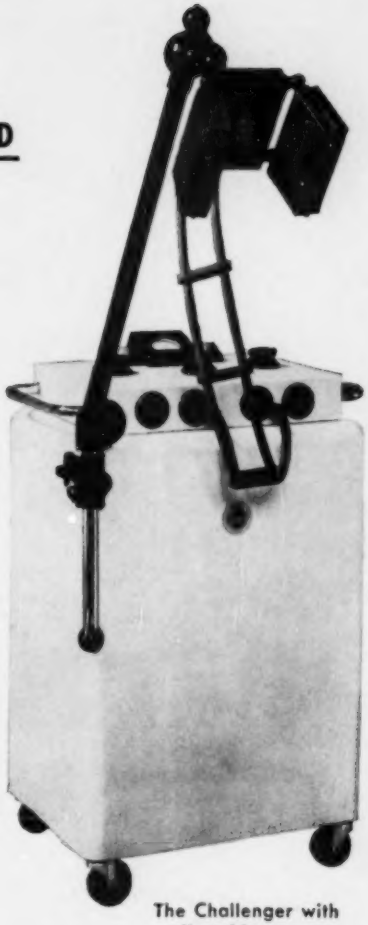

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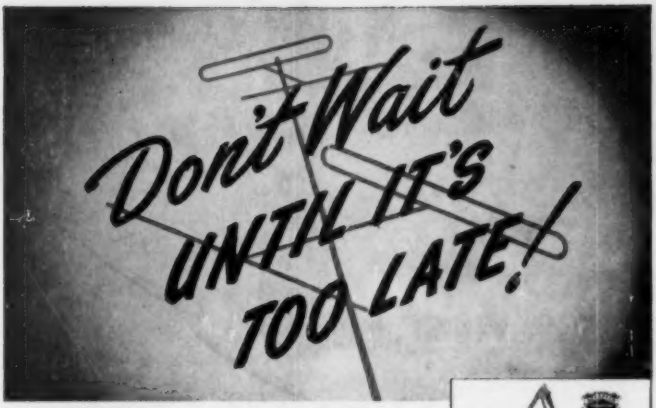

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